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CHLORPROMAZINE HYDROCHLORIDE IN ANAESTHESIA

A REVIEW OF 360 CASES

JOHN TAIT RUSSELL, M.B., B.Ch. (RAND), D.A. (ENG.), D.A. (IRE.)

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Anaesthetists all over the world are constantly seeking techniques which will protect patients from surgical assaults and yet ensure a rapid return of consciousness and minimal morbidity and mortality. Possibly what may yet prove to be one of the most useful aids since the introduction of the relaxants is the ever-growing knowledge of the phenothiazine derivatives. Of these, the most generally useful to date is chlorpromazine hydrochloride (dimethyl amino-propyl-N-chloro-phenothiazine hydrochloride)—Largactil. First brought to the attention of the medical profession in 1952 by Laborit and Huguenard¹ and Delay *et al.*,² this drug has received considerable attention in all parts of the world.

Pharmacology

Decourt³ discusses the 'narcobiotic effect' which protects from the 'phenomena of Reilly'⁴ or, as Selye⁵ terms it, the 'reaction of alarm'. (Samson Wright,⁶ commenting on a review⁶ of this French work, prefers to suspend judgment until it has been confirmed.) This narcobiotic action is said to diminish the activity of all the cells of the body, increasing their resistance to stress. The clinical result of this will depend on the effects on the most specialized and active cells of the body, such as those of the reticular formations, particularly in the brain. This will affect the central control of heat regulation, the vomiting centre, and the general tone of encephalic activity. This function is not related to its anti-adrenaline action. Promethazine acts in a similar way, but is a potent antihistaminic with little or no anti-adrenaline action.

Chlorpromazine appears to have no ganglion-blocking action,⁷⁻⁹ but depends, for its clinical effects on this action on the reticular formations and its anti-adrenaline action.

Natural sleep and the sleep produced by chlorpromazine was compared by Terzian¹⁰ and found to be similar.

This was confirmed by Hiebel *et al.*¹¹ and Dobkin *et al.*¹² by means of electro-encephalographic tracings.

Experimental work on animals

The following has been shown in experimental work on animals with chlorpromazine:

1. Sedative effects are proportional to the dose administered.
2. Convulsions due to strychnine, picrotoxin and metrazol are not affected by the drug.
3. Neither competitive block nor depolarizing block is produced at the neuromuscular plate.¹³
4. Small doses block sympathetic vasopressor reflexes; large doses block vagal reflexes.¹³
5. It protects against ventricular extrasystoles and fibrillation during chloroform anaesthesia in dogs and cats.¹³
6. It has a strong anti-emetic action in animals and humans, which is believed to be due to competition for the chemo-receptor emetic trigger-zone and depression of the reticular vomiting centre.¹⁴
7. It causes no significant alteration in the glomerular filtration-rate or renal blood-flow in dogs.¹⁵

CLINICAL SERIES

The present series of 360 cases comprise a cross-section of operations performed at the average general hospital, under general anaesthesia (Table I). All these anaesthetics were administered by the author, either alone or, in the thoracic operations, with Dr. C. H. van Hasselt. No shocked or exsanguinated patients were given chlorpromazine since it was felt that the peripheral vasodilatation caused by the drug was a complete contraindication in these cases.

Premedication Technique. On the evening before operation, at 8 p.m., the patients were given 100 mg. of chlorpromazine orally. If by 11 p.m. they were not asleep a small dose of a barbiturate (1½ gr. of quinalbarbitone) was administered. Patients were warned that getting out of bed might cause dizziness; 2 patients who ignored this warning actually fainted (due to the fact

that the blood pressure becomes orthostatic). In the earlier cases 150 mg. was given, as recommended by Dobkin *et al.*,¹² but because of the rather high incidence of giddiness, even on sitting up in bed, this dose was reduced to 100 mg. In children and small or debilitated patients this oral evening dose was omitted.

In adults over 10 stone, on the day of operation, 50 mg. of chlorpromazine was administered intramuscularly 2 hours before operation (in children and small adults the dose was 1 mg. per 3 lb. body weight). This injection did not cause any local reaction in any of our patients. Atropine, 1/100 gr., was given $\frac{1}{2}$ hour before operation, because it was found that the drying effect of the chlorpromazine alone was not sufficient.

Anaesthetic Technique. Induction was usually effected with thiopentone sodium, except in the smallest children. Endotracheal intubation was performed where there was difficulty with the airway, or when relaxants were used and controlled respiration was required. Maintenance of anaesthesia was varied, either closed or semi-closed circuits being used. Nitrous oxide and oxygen was the routine anaesthetic, with minimal trichlorethylene, pethidine in fractional doses, minimal ether, or cyclopropane.

Types of Operation performed. The operations included in the series of 360 cases are shown in Table I:

TABLE I

Gynaecological

Total abdominal hysterectomy ..	31	
Vaginal hysterectomy and repair ..	20	
Fothergill repair ..	22	
Salpingectomy and oophorectomy ..	8	Total 81

Plastic

Skin grafts ..	23	
Plastic operations to face ..	12	
Plastic operations to breasts ..	3	
Cleft palate and hare lip ..	12	Total 50

General Surgery

Gastrectomy ..	20	
Cholecystectomy ..	16	
Intestinal obstruction ..	7	
Perforated peptic ulcer ..	3	
Appendectomy ..	27	
Herniorrhaphy ..	14	
Mastectomy ..	14	
Amputation of leg ..	4	
Subclavian aneurism (false) ..	1	
Dissection of cervical glands ..	10	
Ligation of vena cava * ..	1	Total 117

Ear, Nose and Throat

Laryngectomy ..	4	
Mastoids ..	15	
Antrostomy ..	12	
Tonsillectomy ..	17	Total 48

Urological

Nephrectomy ..	7	
Prostatectomy ..	10	
Urethropexy ..	2	Total 19

* Previous mitral valvotomy; very apprehensive.

Thoracic

Pneumonectomy ..	5	
Lobectomy ..	14	
Diaphragmatic herniorrhaphy ..	4	
Mitral valvotomy† ..	18	
Aortic valvotomy‡ ..	1	
Patent ductus arteriosus ..	2	
Thoracotomy and lung biopsy ..	1	
Gastro-pharyngostomy ..	2	Total 47

Total of all operations 360

† One case of acute pulmonary oedema on induction.

‡ A 25-minute cardiac arrest, with recovery.

CLINICAL EFFECTS**Pre-operative**

The demeanour of patients was calm and they did not appear apprehensive (*la belle indifférence* mentioned by Dobkin¹⁹ in a recent article). A common remark was, 'Doctor, I'm terrified!', this usually said with a happy smile! As a rule they slept quietly in the anteroom to the theatre, were easily aroused to answer questions, but went off to sleep again almost immediately.

There were exceptions to this. One was a child who had had a series of plastic operations. Undoubtedly she would have done better on rectal 'pentothal', for she yelled from the time she was brought to the theatre until induced. This did little to impress the surgeon with the value of chlorpromazine as a premedicant! However, this was the only child who did not manifest *la belle indifférence*.

The only other patient who did not derive pre-operative benefit was a 35-year old woman with congestive cardiac failure who had undergone a mitral valvotomy 2 years before and was now to have a ligation of her inferior vena cava, in an attempt to reduce the load on the right side of the heart. She was very frightened, but came through the operation extremely well.

The patient's skin was warm and dry, in some cases pale, but this was variable, the pallor developing during operation, after operation, or not at all. The temperature usually fell slightly, but the fall was seldom more than 1-2° F. Clinically, respiration appeared normal (Dobkin,¹² found a rise in oxygen consumption, but depressed respiration). Blood pressure tended to fall, but seldom by more than 20 mm. Hg systolic, and easily controlled by positioning. The pulse rate varied, but was usually raised to about 90 per minute.

Both the drop in blood pressure and the raised pulse-rate are due to a peripheral vasodilatation. This suggests that the use of chlorpromazine in shocked or exsanguinated patients is contra-indicated.

Course of Anaesthesia

Induction was uneventful as a general rule; relatively small doses of thiopentone were required, 0.25-0.5 g. being a usual amount even in robust patients. In fact it was found that, in order to get a speedy post-operative recovery of reflexes, smaller doses than usual were essential. This, however, did not apply to the relaxants in this series of cases.

Maintenance of anaesthesia was effected with a minimum of anaesthetic, less being required than with other premedicants.

One of the most striking features was the protection given to the patient from shock-producing procedures, such as pulling on the mesentery, and thoracotomy in which the rib-spreader was used. The blood pressure and pulse remained remarkably constant and, providing that blood replacement was adequate, the patient retained his or her condition remarkably well. Sometimes there was marked pallor, but pulse and blood pressure remained unaltered, the skin remaining dry and warm. Nevertheless, this pallor would sometimes cause comment from the surgeon.

Reaction to accumulation of carbon dioxide is minimal. The pulse will become full and bounding but there will be no sweating. A nice full pulse may mean, therefore, not that the patient is in excellent condition, but that the carbon dioxide has reached dangerous levels.

In operations on the head and neck a reasonable degree of hypotension could be attained by raising the head of the operating table. Pressures of 80-90 mm. Hg. were usual. The blood pressure rose immediately when the head of the table was dropped. This, it is felt, is a safer method of producing hypotension than most of the others in use at present; it gives sufficient aid to the surgeon for the usual run of operations, without extreme risk to the patient.

In the thoracic operations, we were satisfied that chlorpromazine was of real benefit to the patient. The cardiomyotomies gave us less cause for alarm than usual, although the number of cases in this series is too small for definite conclusions. Other workers have found the drug to be beneficial in this type of case^{19,20} (Boulton²⁰ used the drug by mouth alone).

No difficulties were experienced in assessing the depth of anaesthesia, such as were found when we used the 'lytic cocktail' (see further remarks).

Post-operative Course

Patients recovered their reflexes and answered to their names either before they left the operating theatre or within 5-10 minutes of returning to the ward. This compares favourably with the other methods of pre-medication.

The amounts of post-operative analgesic drugs were not decreased to any extent, for the chlorpromazine is usually excreted within 6 hours. If post-operative analgesics were given in a reasonable time (2-3 hours after operation) the patients were comfortable and moved about easily in bed. Most patients sat up on the first post-operative day, which is important in preventing pulmonary and thrombotic complications.

There were no cases of venous thrombosis in the series (the general incidence of thrombosis at this hospital is low).

There was little amnesia for pre-operative events, but these were viewed with equanimity.

Post-operative nausea and vomiting were minimal. Patients would vomit once but, once the contents of the stomach had been evacuated, only 2 of this series of patients complained of nausea, and only one continued vomiting—for 1 day.

In this series there were no cases of liver damage

which is one of the serious complications of chlorpromazine.^{21,22,23}

Comparison with Alternative Techniques

The routine of premedication described in this paper was undertaken as an alternative to the intravenous use of the 'lytic cocktail' which was applied in a series of over 70 cases at this hospital in 1954. The 'lytic' mixture consisted of: Chlorpromazine 50 mg., Promethazine (Phenergan) 50mg., and Pethidine 100 mg. It was run into a vein in a dilute solution, the patient's condition being assessed every few minutes.

The advantages of the 'cocktail' technique were:

1. Prevention of traumatic shock.
2. Almost complete absence of post-operative nausea and vomiting.
3. Tremendous reduction in the amount of anaesthetic drugs.
4. Ease of endotracheal intubation due to depression of the respiratory reflexes (this does not really apply, for the short-acting relaxants, succinyl choline for example, facilitate intubation to a remarkable degree).

The disadvantages, which in our opinion outweigh the advantages, are:

1. Extremely slow return of the patient's protective reflexes (one patient was unconscious for more than 10 hours after the operation).
2. Marked drop in blood pressure, particularly in patients with hypertension (one patient's systolic blood-pressure dropped from 220 mm. Hg to 80 mm.).
3. Difficulty in assessing the patient's condition and the stage of anaesthesia. Patients apparently well anaesthetized would suddenly react violently to stimuli. Blood replacement had to be meticulous, for the patient's initial response to blood loss was minimal. (This applies to a lesser extent when the drug is used intramuscularly.)
4. Difficulty in deciding which drug was responsible for any untoward effects, there being no really effective antidote to chlorpromazine. Polypharmacy is not necessarily synonymous with balanced anaesthesia.¹⁶
5. Respiratory depression over a long period leading to carbon-dioxide accumulation with all its dangers, as recently pointed out by Pask.¹⁷
6. Frequent occurrence of venous thrombosis even when dilute solutions were used.

It is therefore surprising that in March 1955, a further series of cases was written up in which this 'cocktail' technique was used.¹⁸

The 'lytic cocktail' technique did suggest that a method might be evolved which would give the advantages of sedation, protection from traumatic shock, and marked reduction in post-operative nausea and vomiting. The use of chlorpromazine alone, given intramuscularly, was first suggested by Dobkin *et al.*¹²

DISCUSSION

The advantages of chlorpromazine used as a premedication were virtually those of the 'lytic cocktail' with less disadvantages. The advantages are as follows:

1. Protection of the patient from neurogenic shock.
2. Reduction in post-operative nausea and vomiting.
3. Reduction in anaesthetic agents required.
4. No long period of unconsciousness with its concomitant dangers of increased morbidity.
5. No marked depression of respiration.

6. The pre-operative equanimity exhibited by practically all patients, without deep narcosis.

7. Orthostatic blood pressure, giving a degree of easily obtainable but safe hypotension when required.

8. Minimal depression of the cough reflex.

9. No sweating, and thus less fluid loss during operation.

The *disadvantages* are as follows:

1. The extreme care that has to be taken to replace blood loss.

2. Orthostatic blood-pressure (this is also an advantage) for 4-6 hours. This leads to occasional faintness and sometimes even to collapse. Positioning of the patient in the head-down position is usually sufficient to raise the blood pressure within a few minutes.

At no time did we have to resort to vasopressor drugs, although there is some doubt whether, except for nor-adrenaline, these drugs have much effect in this way. Occasional patients did complain, even when lying flat, that they felt 'terrible'. These patients all had a drop in blood pressure above average.

3. When post-operative collapse occurred (it did happen in 2 cases—both gynaecological operations) it was difficult to decide whether the collapse was due to haemorrhage, to shock, or to the chlorpromazine. On both occasions the blood pressure rose with blood transfusion. These cases both help to show the importance of adequate blood-replacement.

4. There is no true antidote but, if the intramuscular dosage of 1 mg. per 2½ lb. body-weight is not exceeded, reactions are minimal.

It appears that chlorpromazine used as a premedicant drug is of real advantage to patients and may even be the factor which 'gets them through'. Post-operative morbidity is decreased, for the patient remains in better condition than would otherwise have been the case, and thus recovery is facilitated.

SUMMARY

The pharmacology of chlorpromazine is briefly discussed.

A series of 360 cases are reviewed in which chlorpromazine was used as a premedicant drug.

The advantages and disadvantages are enumerated, the former outweighing the latter.

The use of the 'lytic cocktail' is discussed, to be condemned as 'polypharmacy'.

The reasons for not using chlorpromazine in shocked patients are mentioned.

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South African Medical Journal

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VAN DIE REDAKSIE

DIE VERVANGING VAN GROOT ARE

'n Nuwe mylpaal op die gebied van chirurgie is die vervanging van beskadigde bloedvate deur nuwes. Operasies wat toestande soos saampersing van die aorta, buikaorta-aneurisma en trombose van grotere slagare herstel, is nie meer sonderling nie en alhoewel hierdie operasies nog lewensgevaarlik is, is hul lankal nie meer medies voorbladnuus nie. Dit het al 'n instelling in baie sentrums geword om groot seksies bloedvate, wat deur vernouing, fibrose of ontsteking aangetas is, te vervang.

Alhoewel vatvervanging tot nog toe grotendeels tot die slagare beperk is, is aandag onlangs gevestig op die moontlikhede om in geval van obstrukties groot are soos die boholaar te vervang. Hierdie prosedure lewer groter probleme. Die wande van die are is dunner en derhalwe vou hul makliker op en druk hul makliker plat; en die druk in die are is te laag om die buisholte oop te hou op dieselfde manier wat die druk in die slagare dit doen. Aaroorplantings is dus meer geneig om te kinkel as slagaaroorplantings, met drastiese gevolge, aangesien dit 'n uitstekende terrein voorsien vir die vorming van 'n bloedklont. Deterling en Bhonslay¹ het onlangs proefnemings met honde gedoen en die boholaar met seksies aorta vervang. Hul het gevind dat 'n maand nadat die operasies gedoen is nie 'n enkel oorplanting patent was nie; almal is deur bloedklonte verstopt. Hierdie komplikasie is waarskynlik ook die grootste struikelblok by die mens.

Nietemin bied gelyksoortige aorta-oorplantings (*aortic homografts*) tans waarskynlik nog die grootste hoop vir ingrypende behandeling van die sogenaamde boholaar-sindroom. Die handboekbeeld van hierdie toestand—aanhoudende sianose, oorvulling van die are van die kop en nek, met hewige hoofpyne en miskien asemnood—word nie altoos waargeneem nie; somtyds is daar geen simptome nie. Die toestand vererger gewoonlik omrede van die sombere prognose wat aan die oorsakende faktore verbonde is—kwaadaardige medias-tinummewasse (die algemeenste oorsaak), aorta-aneurisma, kroniese fibrosende middelvliessontsteking en toringagtige middelvliesslimfkliere. Tensy die oorsakende obstruksie permanent verwyder kan word, is dit natuurlik nutteloos om die herstel van die boholaar te oorweeg soos bv. in die geval van kwaadaardigheid of aneurisma. Met 'n goedaardige gewas of 'n veselweefselmassa of tuberkuleuse kliere wat uitgesny kan word is die posisie egter heel anders. Nadat die meganiese

EDITORIAL

REPLACING LARGE VEINS

One of the recent advances in surgery is the replacement of diseased or damaged blood-vessels by new ones. Operations rectifying such conditions as coarctation of the aorta, abdominal aortic aneurysm, and thrombosed major arteries, are no longer exceptional and, although they remain procedures hazardous to life, they have long ceased to make surgical headlines. The replacement of large sections of stenosed, fibrosed or phlebitic blood-vessel is an established procedure in many centres.

While most of the work done in vessel replacement so far has been on arteries, recent attention has been focused on the possibilities of replacing veins such as the superior vena cava in cases of obstruction. This procedure poses greater problems, for the veins have thinner walls, which make them more easily collapsible and compressible, and the venous pressure is too low to exert the same influence as the arterial pressure does on the patency of the lumen. It follows therefore that a venous graft is likely to angulate more easily than an arterial one, and with dire results, since this produces an ideal site for thrombus formation. In recent experiments in dogs, in which the superior vena cava was replaced by sections of aorta, Deterling and Bhonslay¹ found that one month after the operations had been performed not a single transplant remained patent; all had been occluded by thrombi. This complication seems to be the chief stumbling-block in human studies as well.

Nevertheless, aortic homografts appear to be the best hope at the moment in the radical treatment of the so-called superior-vena-caval syndrome. The text-book picture of this condition—persistent cyanosis and venous engorgement of the head and neck, with severe headaches and perhaps dyspnoea—is not invariably seen; sometimes there may be no symptoms at all. However, it is usually progressive, because of the sombre prognosis attached to the causative factors—malignant mediastinal tumours (the commonest cause), aortic aneurysm, chronic fibrosing mediastinitis, and mediastinal tuberculous lymph-glands. Of course, unless the causative obstruction can be permanently relieved, there is no point in considering a superior-vena-caval repair, e.g. in malignancy or aneurysm. The position, however, is different with a benign tumour

druk op die aar verlig is en die aar blootgestel is kan 'n gelyksoortige oorplanting (*homograft*) uitgevoer word. In die 9 gevalle van oorplanting vir boholaarverstoping waaroor dusver verslag² gedoen is, was die resultate in 6 gevalle onbevredigend—in meeste van die gevalle het trombose na die operasie ingetree. Die 7de pasiënt het 4 maande na die operasie gesterwe en in die 8ste geval was die oorplanting 'n mislukking. Die jongste geval is die een wat deur Deterling en Bhonslay gerapporteer is met tuberkuleuse kliere as oorsaak van die obstruksie. Die segment van die aar met die trombose was uitgesny en vervang deur 'n gelyksoortige aorta-oorplanting (*aortic homograft*) wat al vir 18 maande hou en volkome verligting van die pasiënt se simptome gebring het. Geeneen kan hierdie reeks gevalle as suksesvol toejuig nie en hierdie werkers beklemtoon tereg dat verdere navorsing i.v.m. die vervanging van die groot are noodsaaklik is. As daar 'n oplossing te vinde is, skyn dit—vir die oomblik altans—of dit gesoek moet word by oorplantings met menseslagare eerder as met sintetiese stowwe soos, 'nylon' en 'dacron'; dit is maar nog gissing.

1. Deterling, R. A. en Bhonslay, S. B. (1955): *Surgery*, **38**, 1008.
2. Annotation (1956): *Lancet*, **1**, 144.

or a mass of fibrous tissue or tuberculous glands which, being resectable, are amenable to surgical treatment. After relieving the mechanical pressure on the vein and exposing it, a homograft can be performed. Of the 9 cases so far reported² in which superior-venacaval obstruction has been treated by grafting, 6 have ended unsatisfactorily, most of them with post-operative thrombosis. The 7th patient died 4 months after operation, and in the 8th case the graft was a failure. The latest case is the one reported by Deterling and Bhonslay, in which tuberculous glands were the cause of the obstruction. The thrombosed segment of the vein was resected and replaced by an aortic homograft, which has held for 18 months and has 'completely relieved' the patient's symptoms. None can acclaim this series of cases as a success, and these workers rightly emphasize the need for further research into replacement of large veins. If a solution is to be found, then it seems—for the moment, at any rate—that it will lie in the field of grafts made from human arteries rather than those made from synthetic materials such as nylon and 'Dacron'; but this is still conjecture.

1. Deterling, R. A. and Bhonslay, S. B. (1955): *Surgery*, **38**, 1008.
2. Annotation (1956): *Lancet*, **1**, 144.

DISPENSING DOCTORS

The Minister of Health has omitted from the Medical, Dental and Pharmacy Bill the egregious clause which was to have denied to medical practitioners the right to dispense and supply medicine for their own patients within 5 miles of a municipality containing a chemist's shop. But the danger is still present, for though the clause is no longer in the Government measure it may yet be inserted on the motion of a private member. The Pharmaceutical Society of South Africa has for some time been agitating for legislation on these lines, and it is reported that members of Parliament have been receiving telegrams urging them to support the clause. The Medical Association and, it is understood, the Medical and Dental Council, have been active in their opposition.

It is a grave attack on the traditional rights and prerogatives of the medical profession. Let no one suppose that the right to dispense was conferred on medical practitioners by Parliament in the section of the Medical, Dental and Pharmacy Act, 1928, which the dropped clause proposed to amend. This Act largely repeated former legislation and gave legal sanction to custom. The fact is that from the dawn of Medicine, and for centuries, the patient looked to his doctor to supply the 'medicine' needed for his treatment. This conception is reflected in the very languages we talk, for in English and Afrikaans the word 'medicine' (or *medisyn*) stands both for the healing art itself and the *materia medica* which the patient receives. Once upon a time an apothecary was a medical practitioner, and a registrable licence to practice medicine is still conferred by the Society of Apothecaries, London and Apothecaries' Hall, Dublin.

We need not go back to the middle ages to hunt down this tradition. In the memory of people still living most general practitioners kept a dispensary and made up the medicines they required for their patients. Busy practitioners came to relegate the dispensing to assistants and, as the custom grew of handing the prescription to the patient to be made up by a dispensing chemist, dispensing by doctors grew less until now the general practitioners who do not ordinarily dispense probably greatly outnumber those who do.

Nevertheless, dispensing still remains a proper function of the medical practitioner. In the platteland many doctors still dispense, and even in the larger towns there are doctors who carry on the old tradition. Probably most general practitioners sometimes meet the convenience of a patient by supplying him with some medicament that he needs. In Provincial and Government hospitals it still falls to the doctor to work in the dispensary outside the hospital pharmacist's working hours, and in some small hospitals no pharmacist is employed at all. While, then, a great number of medical practitioners have found it convenient to leave dispensing to the chemist, the profession has never abandoned—nor has it been allowed to abandon—its function of dispensing.

This is a matter that can safely be left to settle itself without legislation. As towns and villages develop chemist's shops will become available for an increasing proportion of the population, and the number of doctors who regularly dispense their patients' medicine will become smaller. Probably dispensing by doctors will never entirely cease, nor, in our opinion, is it desirable that it should. A law making it a criminal offence or an ethical delinquency for doctors to

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exercise their time-honoured function of dispensing for their patients, within a certain distance of a chemist's shop, would in our opinion be an affront to an honourable profession. Nor would it be in the public interest. No doubt as many towns and villages as possible ought to have the amenity of a pharmacy, but not by legislation of this kind. Besides, the chemist and druggist is by no means exclusively dependent on doctors' prescriptions. Most chemists sell household remedies, patent medicines, and any other medicine not forbidden by law to be sold, and are ready to give advice about treatment from the patients' symptoms; and their trade is usually not confined to medications. The interests of the non-Europeans have been

cited as an argument in favour of the clause. Can it be in the interests of the poor to require that the patient shall not only be responsible to the doctor for his fee, but shall pay a chemist as well? And might it not well be a hardship to enforce a journey up to 10 miles or more to obtain the medicine which the doctor has ordered?

Finally, is it just or reasonable that a doctor who is earning his living by carrying on a dispensing practice within the 5-mile limit should suddenly be required by law to cease; and that outside that limit dispensing doctors should be exposed to permanent uncertainty lest a chemist's shop should be opened in his neighbourhood.

SOME ASPECTS OF THE MECHANICS OF THE ABDOMEN*

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The understanding of intra-abdominal mechanics has eluded research since the very early days of medical science. During the 19th century and up to the time of World War I, substantial investigation into abdominal dynamics was made. These researches fell into decline because of the difficulty of the project generally, and because it was regarded as impracticable to measure intra-abdominal pressures. However, during the World War II the subject obtruded itself again, presumably because of war wounds and the problems of aviation medicine.¹⁻³ It would be misleading to say that workers are lacking who have concerned themselves with abdominal mechanics. We have been unable, though, to discover much in the way of new publications of significance after 1950.

The large hiatus in our present-day knowledge is certainly noticeable when we attempt to explain the etiology of conditions such as paralytic ileus, acute dilatation of the stomach, uterine prolapse and displacements, enterocele, hernias, the mechanisms of parturition, defaecation and micturition, visceroptosis (if such a condition exists), oesophageal regurgitation and dyspepsia, board-like rigidity of the abdomen, etc.

Coffey,⁴ in 1917, said, 'Except in chronic processes, such as the development of a tumour by cellular increase, a cyst or ascites which has behind it the blood pressure or pregnancy, there is but little change in the capacity of the abdomen of an otherwise normal person'. In 1922 Coffey⁵ was still of the opinion that the abdominal walls were relatively inelastic. This he assumed to be an important factor in the 'splinting' of the abdominal contents and so increasing the intra-abdominal pressure; particularly when the deposition of intra-abdominal fat occurred, for instance, in obesity or in the West-Mitchell technique of the rest cure and forced feeding for neurasthenics and visceroptotics. Unfortunately

no actual pressure-readings were taken and the conclusions were mostly assumptions.

Goffe,⁶ in 1912, attempted to define intra-abdominal pressure, and I think his definition is as good as any I have come across. He defined it as 'the pressure within the abdomen due to external atmospheric pressure, to gravity, to muscular contraction of its walls, to intravisceral pressure'. Rushmer³ would add to this 'the head of pressure provided by the mass of the movable organs within the peritoneal cavity' (which in fact is the same as gravity).

In those days, as today, the general impression prevailed that intra-abdominal pressure is negative and that under certain circumstances there is a tendency to produce vacuums. With this in mind, it was said that the organs in the abdominal cavity were held in place by this negative pressure, although the various ligaments might have something to do with it.

Sturmdorf⁷ said that there was no muscle or ligament that could withstand the continuous force of the intra-abdominal pressure. These ligaments, according to him, support the organs not by virtue of their textural resistance, but by deflecting the displacing force of intra-abdominal pressure.

If it were true that the intra-abdominal organs maintained their relative positions by virtue of deflective forces pushing down on the one hand and supporting on the other, then one must postulate a central area in the abdominal cavity exerting pressure in all directions. Obviously the force supporting the under-surface of the liver must be diametrically opposed to that pressing down on the superior surface of the uterus. The answer is still unknown. Clearly there is no single factor which is solely responsible for the position of the viscera; but ligaments, intra-abdominal pressure and support from adjacent organs seem to be the most important.

In the strict physical sense the question may well be

* A paper presented at the South African Medical Congress, Pretoria, 1955.

asked: Is there such a thing as intra-abdominal pressure? Can the abdominal cavity be considered as one physical unit? First of all, there is no abdominal cavity in the physical sense, except in the case of ascites, pneumoperitoneum or peritonitis, where there is a cavity filled with liquid, air, or both.

Unless there is fluid in the peritoneal cavity, the abdominal wall surrounds a multitude of organs tightly adjacent to each other and tightly adjacent to the wall; the interspaces between two organs, or between an organ and the abdominal wall, are merely potential. The serosa with its moisture, sees to it that no friction takes place on the one hand and that no spaces are created on the other.

For the present, I will consider the abdominal cavity as including the pelvic region as well. Thus the limits of the cavity are the very mobile diaphragm above, the pelvic floor below, the rather rigid spinal column behind, and in front and at the sides the fairly flexible and elastic muscular abdominal wall. Within these boundaries are the abdominal and pelvic organs, both solid and hollow, surrounded by their fat and peritoneum. The retroperitoneal plane, with its spongy connective tissue, fat and kidneys, does not participate to any degree in the present problem, the exceptions being retroperitoneal tumours encroaching on the capacity of the abdominal cavity.

One then assumes that the capacity of the abdomen is very variable, differing from subject to subject according to body build, muscular tone, obesity, posture, etc.

Being a striated muscle, the *diaphragm* is subject to cortical impulses and can be moved at will. However, unlike all other striated muscles, it retains its full coordinated function at a time when our voluntary control of striated muscles has partially or entirely ceased—during general anaesthesia and in coma. The cessation of diaphragmatic function causes death. There are many theories which attempt to explain the ambivalent position of the diaphragm, but none is very conclusive. The importance of the diaphragm in the consideration of abdominal physiology is very great. Normally it is continuously mobile and is the common factor in the changing pressures within the abdomen and thorax. Many believe that it is because of the pumping action of the diaphragm that a continuous circulation of the peritoneal fluid occurs.

Cane⁸ says, 'There cannot be any question as to the existence of an over-all intra-abdominal pressure, and that the organ capable of increasing or diminishing the pressure is the diaphragm'.

Although one agrees that the diaphragm is probably the most active participant associated with variations in intra-abdominal pressure the powerful muscular wall of the abdomen must not be overlooked, for often the diaphragmatic position is secondary to the action of these muscles.

We know from every-day experience that intra-abdominal pressure certainly exists and is very variable; witness the individual trying to expel a hard stool, the woman in labour, and the prostatic in urinating.

It is an error to regard the abdomen as a rigid structure. The attitude should rather be that the boundary

walls of the abdominal and pelvic cavities form one somewhat complex organ in themselves and that, to a major degree, the functions of the organs encased therein depend upon its state, and *vice versa*.

One may compare the abdomen to a sealed cylindrical rubber bag which is being suspended by its upper margins. This bag is also partially filled with liquid and the remaining air drawn off. The rubber wall is regarded as being the counterpart of the abdominal wall, and the liquid as simulating the abdominal contents.

One will find that no matter what the position of the bag is, the fluid will always find its own level. This will alter the shape of the bag accordingly.

In the vertical position the fluid will gravitate to the lower part of the cylinder and the rubber bag will assume a pear shape. The pressure above will then be much less than that at the bottom of the cylinder. This difference in pressure is due entirely to the difference of the levels of the water column measured. This increased pressure at the lower level has been shown to exist in both animals and the human being. Rushmer showed that this state existed in dogs. In our experiments we have shown that in the supine position intragastric and intrarectal pressures are identical, but that in the erect posture the intragastric pressure is less than the intrarectal pressure. This difference in pressure is equal to the pressure of a column of water between the two levels at which the readings were taken (Fig. 1).

In the horizontal position one finds that the bag flattens and tends to bulge at the sides. Obviously the degree of distension, bulging and flattening will depend upon the elasticity of the rubber wall; and in the human being upon the muscular tone of the anterolateral abdominal wall. An anaesthetized patient, with a relaxed abdominal wall, in the supine position, will also tend to bulge in the flanks. This tension is the reason why air rushes into the peritoneal cavity when the peritoneum is opened. This has in the past created the misconception that the intraperitoneal pressure is a negative one.

One must then understand that with various alterations in the shape and position of the abdomen, variations in the intra-abdominal pressure will occur. The tendency to produce vacuums is halted by the fact that the external atmospheric pressure will always replace space by pushing inwards either the anterior abdominal wall, the diaphragm, or to a lesser extent the pelvic floor. Lower pressures are certainly obtained, but hardly ever a pressure less than that of the atmosphere.

As already indicated, the pressure immediately beneath the dome of the diaphragm may be less than that of the atmosphere. If the anterior abdominal wall is distended, then the diaphragm comes down in an attempt to retain the original volume. If the descent of the diaphragm is insufficient to do this, then one assumes that the gut dilates in order to occupy the remainder of the available space. The position is reversed when the abdominal wall is rigid and retracted. One then sees the diaphragm as a fixed dome at a higher level than normally.

In straining, however, the position is altered and one finds both the abdominal wall rigid and retracted, and

the diaphragm pushed downwards. If a person strains hard enough something has to give way, and the result is the passage of either urine, flatus or faeces.

It has been stated that the diaphragm has an ambivalent nerve-supply and that it is subject to cortical impulses. The precise amount of control that the cortex has over the diaphragm is, however, questionable. One knows of no means whereby isolated diaphragmatic movements in the living human being can be studied. Movement of the diaphragm is always associated with movements of either abdominal wall or thoracic musculature. The more one attempts to move the diaphragm as an isolated muscle, the more one is impressed by the difficulty of so doing. It seems as though, to a great extent, the movement of the diaphragm is almost completely dependent upon thoracic and abdominal muscular activity. Can one cough without using the anterior abdominal wall? Can one breathe voluntarily without making use of either the abdominal or thoracic musculature?

PUBLISHED RESEARCH

The present-day knowledge of the actual intra-abdominal pressure is confusing. Pressure studies within the human intraperitoneal space have very rarely been reported. The subject is confused by misleading nomenclature, such as intra-abdominal pressure, intraperitoneal pressure, and intravisceral pressure.

In a review of the literature up to 1911 Emerson⁹ cited 4 authors who stated that the intra-abdominal pressure was atmospheric, 6 that it was negative, 12 that it was positive and 5 that it was variable. Emerson himself made 24 experiments and he concluded that the intra-abdominal pressure was slightly positive. He also proved that under normal conditions there is no free gas to be found in the intraperitoneal cavity.

Keppich¹⁰ (1921), using intraperitoneal needles in dogs and human subjects, concluded that the normal intraperitoneal pressure in man varies from 0.5 to 3.4 cm. of water.

Wildegans¹¹ (1924), measuring the intraperitoneal pressures in human beings, found that only in one case was the pressure negative, and this only during an inspiratory dyspnoea. The same author demonstrated that in order to introduce air into the peritoneal cavity, a positive pressure of 4 cm. of water was required in experimental rabbits and from 1.5 to 12 cm. of water in human beings. These subjects were all in the horizontal position and the abdominal wall was punctured near the umbilicus.

Wagoner¹² (1926) and Salkin¹³ (1934) working with monkeys, rabbits, cats and dogs encountered intraperitoneal pressures fluctuating between -0.2 and -5.5 cm. of water.

Overholt¹⁴ (1931) in dogs obtained pressures of -0.5 to -10 cm. of water.

Lam¹⁵ (1939), by inserting rubber balloons into the peritoneal cavities of dogs, measured the pressures under varying conditions, and the majority of his readings were above that of atmospheric pressure. Lam also stated that in man in the erect posture there is a pressure of 25-40 cm. of water in the lower portion

of the abdomen and in the pelvis. This pressure decreases as the upper part of the abdomen is reached, until under the dome of the diaphragm a negative pressure may be recorded. If the subject is standing on his head the pressure relationships are reversed.

The main point is that human abdominal pressures have not been taken directly as a regular technique. Direct measurement is essential and is the only thing that will explain certain mechanisms and suggest certain therapies dependent on change of pressure. A wide survey on this basis and with this simple approach, should lead to a full and valuable understanding of the mechanics of the abdomen.

AUTHOR'S TECHNIQUE

Up to the present time various and variable techniques have been used, and this has been the main cause of the chaos. Water manometers, rubber balloons, the closed-system manometer (Lewis) and a host of other ingenious and inaccurate apparatuses have been used. To appreciate the technical difficulties one must realize that the peritoneal cavity is a potential space and that there is a negligible amount of fluid present to act as a conductor of pressures. To overcome this difficulty, liquid or air must be introduced into the peritoneal space, and this immediately alters the original dynamics.

A suitable apparatus had to be found. To my knowledge, the apparatus best suited for this type of work is the electrical strain-gauge attached to an amplifier and a recording unit. This is connected to the patient by means of a fairly rigid-walled polythene catheter of 1-2 mm. bore. For readings of intraperitoneal pressure this tubing is attached to a needle or a cannula, which is inserted into the peritoneal cavity.

To record intragastric pressures it was sufficient for the patient to swallow the tube until a positive pressure-reading was obtained, which indicated that the tip of the tube had passed through the 'negative pressure' area of the oesophagus into the stomach.

Bladder readings were made by connecting the polythene tube to a gum-elastic catheter after the bladder had been emptied.

In all the cases the polythene catheter filled with a fluid (usually normal saline) was sufficient for the satisfactory recording of pressure in almost any situation. A double-channel recorder was used so that simultaneous measurements from 2 different points or cavities could be made. The readings were very accurate and a record of the slightest variation was obtained.

Most of the subjects where intraperitoneal pressures were recorded were cases of ascites or those requiring intraperitoneal gold therapy for malignant disease. One case with uterine prolapse was utilized.

Bladder, rectal and gastric pressures were recorded in normal persons, including myself.

The very limited number of recordings have been made tend to show that the intra-abdominal pressures are from 5 to 25 cm. of water above that of the atmospheric pressure. The lower pressures are usually associated with expiration. On coughing, straining and attaining the erect position, a level of almost 100 cm. of water was reached.

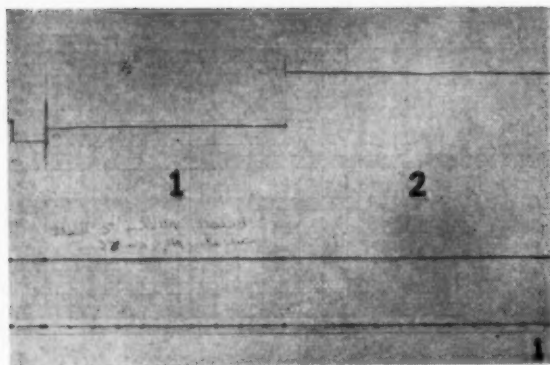


Fig. 1. Graph showing the difference between (1) intragastric pressure and (2) intrarectal pressure. The difference corresponds to the height of a column of water measured from the xiphisternum to the top of the symphysis pubis.

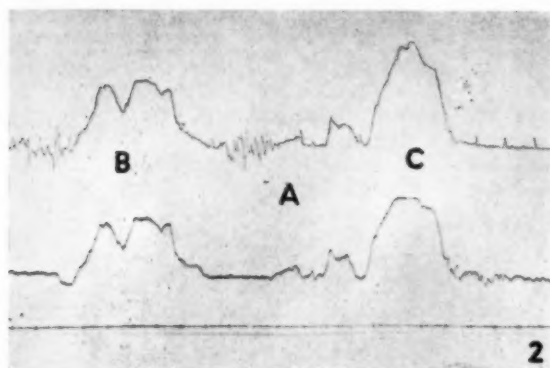


Fig. 2. Simultaneous recordings from the peritoneal cavity (above) and bladder (below) showing the similarity of pressure patterns at rest (A), on coughing (B) and on straining (C).

Simultaneous readings in the intraperitoneal cavity and bladder showed identical patterns and almost exactly similar pressures under various conditions and in different positions. Many more readings need to be made, but these results tend to show that for practical purposes one may use the empty bladder in order to measure intra-abdominal pressures.

APPLICATION

I had hoped to discuss many of the applications of the intra-abdominal dynamics. What happens in oesophageal regurgitation? Is it due to temporarily increased abdominal pressure? Is the mechanism of diaphragmatic hiatus hernia similar? What is the mechanism of acute dilatation of the stomach? How does the air get there and whence does it come?

What of uterine prolapse? Why does it almost always occur after the menopause? Is it due to the usual concurrent increase of weight with an associated increased intra-abdominal head of pressure?

The mechanisms of urination and defaecation have still not been explained satisfactorily. The study of

the mechanism of defaecation is extremely complex, and so is the mechanism of expulsion of the foetus during labour.

These are but a few of the problems. Scores of others are also awaiting investigation and elucidation. Unfortunately, time will allow me to enlarge on only a few of these problems.

The first I shall refer to is the reaction of the abdomen in a rarefied atmosphere, a subject on which Professor Heyns has been working. Both Professor Heyns and I experimented with the cuirass that is placed over the thorax and abdomen in poliomyelitis cases. We found that when the cuirass was exhausted to a pressure of 500-300 mm. of mercury the girth of the abdomen increased by 1½-4 inches. This confirms that the muscular abdominal wall is elastic and distensible, and opens up a new field.

The effect of a rarefied atmosphere is well known to the high-altitude pilot. He knows well the discomfort associated with an ascent after drinking gas-forming fluids. In rapid spins the pilot is in the centre of the rarefied atmosphere and this is associated with abdominal distension. This tends to interfere with the venous return from the lower extremities and abdomen to the thorax. This has led to the development of the 'anti-g' suit, which does not allow this abdominal distension and thus reduces the hazard of 'blackouts'. Decompression illness or the 'bends' is a well-recognized complication of rapid decompression.

Fowler's Position

It has always been assumed that free fluid in the peritoneal cavity gravitates downwards. With excessive amounts of fluid present the bulk of it will no doubt settle in the most dependent regions of the abdominal cavity. How then can the formation of a subphrenic abscess be explained, particularly in the patient being nursed in the Fowler's position? There are two main factors present. One is the capillary action of the thin film of fluid in the peritoneal 'spaces'. This is responsible for the upward displacement of a certain volume of intraperitoneal fluid.

The other factor is that of the low pressure to be found immediately beneath the dome of the diaphragm in relation to the pressure in the remainder of the abdominal cavity during expiration. The pressure immediately beneath the dome of the diaphragm is closely related to that within the thorax, which is generally negative. The diaphragm, as it were, acts as a pump and its movement is to a major degree responsible for a continuous circulation of the peritoneal fluids within the abdominal cavity. There is thus access to the subphrenic spaces for intraperitoneal pus, other fluid and circulating malignant cells. This action ceases when a fluid level is produced by a pneumoperitoneum, as also, to a certain degree, does the capillary traction of the peritoneal fluid i.e., in the erect position.

Cunningham¹⁶ has shown that normally there is an upward flow of the peritoneal fluids towards the subphrenic spaces, where it is absorbed and passes into the diaphragmatic lymphatics. Carmine particles injected into the peritoneal cavity have been shown to be present in the mediastinal lymphatics within as

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short a time as 3 minutes. Meig's syndrome may be a manifestation of this mechanism, where an attempt is being made to remove a pathological amount of fluid draining from the peritoneal cavity into the pleural cavity with the formation of a pleural effusion.

'Pot Belly' and Prolapse

I believe that the 'middle-age spread' one encounters in the male subject is the homologue of uterine prolapse in the female. How often does one encounter the so-called 'pot belly' in the female? Yet uterine prolapse is common.

In the male the inclination of the pelvic brim is of a greater degree than in the female. Moreover, the shape and measurements of the male pelvis lead to a smaller pelvic-floor exposed to pressure from above (Fig. 3).

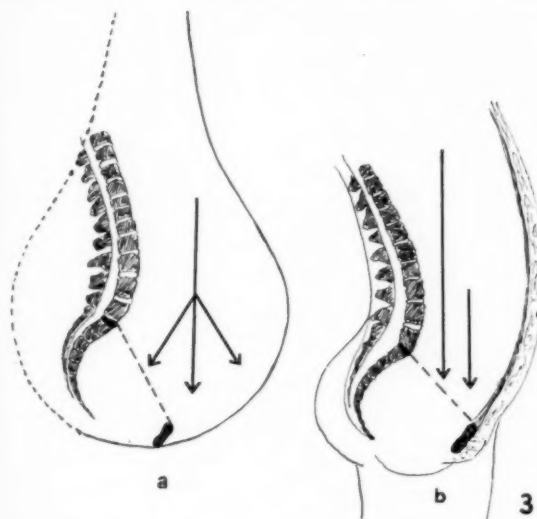


Fig. 3a. The highly tilted male pelvis allowing intra-abdominal pressure to fall mainly on the anterior abdominal wall. Note the pear-shaped contour.

(b) The more 'horizontal' female pelvis. This position causes a greater pressure to be exerted on the pelvic floor.

These male conditions are simulated by the female pelvis in the majority of the African Bantu; and uterine prolapse is a rarity in the Bantu female, but 'pot belly' a common feature, particularly in the younger age-groups.

In the European female the area of the pelvic floor is usually large and of gynaecoid shape, and pelvic tilt is more towards the horizontal. These factors suggest that the pressure exerted on the pelvic floor of the European female, in the majority of cases, is greater than either in the male pelvis or in that of the Bantu female.

Another factor probably playing an important role in the weakening of the pelvic floor musculature of the European female is the use of girdles and corsets. This practice is commonest immediately *post-partum*, and in my opinion it is an important etiological factor

in the weakening and stretching of the pelvic floor. Bantu women, in whom pelvic-floor prolapse is rare, do not wear such apparel.

Middle-age spread is associated with an excessive increase in weight—the exception is the thin visceroprotic, atonic and asthenic person—and we have found that weight gain is also an associated factor at the time when patients develop uterine prolapse. The increased deposition of omental and visceral fat leads to an increased gravitational head of pressure in the presence of an abdominal wall or pelvic floor which has been gradually stretched and weakened as the result of ageing, lack of tone and, in the case of the pelvic floor, previous trauma.

In my opinion an increased intra-abdominal pressure is a factor in the etiology of uterine prolapse. This is borne out in women who develop complete uterine procidentia by straining excessively, e.g. in lifting of heavy objects.

It is noteworthy that hiatus hernia occurs in the same type of female as develops uterine prolapse, viz. postmenopausal multiparae with weight gain. The mechanism in this condition presumably being the increased weight on the diaphragm in the supine position.

CONCLUSION

There is still a vast field to be investigated. When we understand the physics and physiology of the abdominal cavity, only then shall we be able to solve many of our prevailing problems, and this will lead to prevention and the more rational approach to therapy. The study must not be confined to the cavity of the abdomen; the abdominal walls should also be considered. As with the diaphragm, the possibility of an ambivalent nerve-supply to the muscular abdominal wall should be investigated. One is not satisfied that the part played by the rectus muscle and the other flat muscles of the abdomen, in respect of postural and space-altering movements of the abdomen, is clearly understood.

I would like to thank Professor O. S. Heyns for his kind assistance in the preparation of this paper.

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MEDICAL HYPNOSIS*

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The phenomena of hypnosis must have been known since man was first able to record events. In the last 2 centuries interest in hypnosis has periodically waxed and waned, at times amounting to scepticism and scornful neglect. The interesting and striking nature of the phenomena, comparatively easily induced, led to exploitation. Exaggerated and unwarranted claims based on a few dramatic results lead to disillusionment, public hostility and scientific rejection. The medical profession could hardly afford to be identified with practices exciting such strong public disapproval, more especially as the mechanism of hypnosis could not be satisfactorily explained by any current theory on either a physiological or psychological basis.

The passing of the Hypnotism Act of 1952 in the UK is a landmark in the developing public and scientific attitude to hypnotism. After considering the report of a commission, the British Medical Association have this year (1955) officially recognized the value of hypnotism in the treatment of physical and psychological disorders, and recommended that it should be confined to persons subscribing to the recognized ethical code which governs the relation of the doctor and patient.

Most standard methods of induction involve restriction of sensory intake and motor output. The attention is fixed, and there is repetition of monotonous stimulation. Not one of these factors is essential, although most induction procedures include them.

Under hypnosis the subject's behaviour is well organized, purposive and capable of attaining all the complexity of waking behaviour. A sleeping person has a low level of awareness, if any, compared with the hypnotized subject. The latter shows a selective response to the hypnotist, apparently immune to stimulation from other sources and associated with variable suggestibility within the field of awareness. This is known as *rapport*.

The phenomena of hypnosis include the following: Catalepsy with tonic rigidity of muscles or a flaccid inert state; modification of sensation (hyperaesthesia, anaesthesia, and hallucinations of general and special sensation); amnesia and post-hypnotic phenomena. The subject may exhibit altered sensation or behaviour suggested during the hypnotic state, with amnesia for the instruction; regression or revivification—where the subject relives experiences of life in the recent or remote past. If these are accompanied by intense emotional reaction, it is known as abreaction. Pain can also be abreacted. Dreams may be induced. More recently time-distortion has been demonstrated by Ericson and Cooper. In Automatic writing—the hand can be dis-

sociated so that it writes answers to questions without the subject's conscious knowledge.

CASE RECORDS

Mrs. X, 32 years of age. Stated that in December 1954 her husband arrived home after a hunting trip, holding a revolver in his hand. She suddenly felt tired and dazed. Her next memory was waking in hospital with a dead feeling of her right hand and face (similar trance states, lasting for 3 days had occurred before). She complained of phobias for moths, dead violets, death, chrome-plated syringes, taps and revolvers. Attacks of peculiar pain in the right arm, leg and face, with a toothache-like pain in the back. Became terrified after experiencing a vision of her late father on one occasion.

Previous History. Her mother was an alcoholic and committed suicide when she was 4 years old. At 9 years of age she fell from a horse and hurt her back. At 18 years of age, the first attack of pains in the right face, arm and leg occurred while as a nurse she was assisting at an operation. She subsequently gave up nursing on account of numerous symptoms. Three years ago her father was shot by a mentally deranged man. She had been treated by about a dozen general practitioners and specialists, without avail. An eminent orthopaedic surgeon X-rayed her back with negative results. She was diagnosed as suffering from neuritis of the back and given procaine injection of the right sacro-iliac joint.

The patient was admitted on 21 January 1955. Neurological examination was negative. It was decided to investigate her complaints by means of hypnosis.

Hypnosis induced. There was strong emotional disturbance with a vision of her dead father. On waking, she said that the headache which had troubled her for several days, had cleared. Resistance was lowered after hypnosis and associations occurred freely. She related the following: 'The constable put a revolver on the table in Court; when my eyes fell on it, the shiny surface attracted my attention; it was a chrome-plated revolver used by the murderer—The touch of cold steel reminds me of father—My fear of chrome taps is gone; I can now open them without any trouble'.

Hypnosis induced. It was suggested that she would see a black-board, her hand holding a crayon, about to write. After some moments, on being asked what she had written, she replied, 'Nothing—I cannot write or read'—On being asked what her age was, she said '4 years old'. On waking, she expressed her disappointment, as she thought she was not cooperating on account of complete amnesia for the duration of the trance.

Hypnosis induced. After induction, questioned about the moth phobia she regressed to 4 years of age.—Said, 'It was the chalky powder on the moth, marked like eyes'—Then she saw her dead mother in hospital and became very agitated—I asked her whether she saw the connection and she replied, 'Yes, but I am still afraid'. On waking, she said that she had always been afraid of dead violets, now associated them with her dead mother, realized that the recurrent dreams of death were connected with the death of her mother. This explained her fear of dead bodies as a nurse and fear of giving birth to a dead child.

31 January 1955. *Interviewed.* When 9 years old she remembered seeing her grandfather falling from a roof. He afterwards moved about in a wheelchair, his right arm hanging down. She thought it strange at the time that only one side was affected. Now realized the connection with her right arm and leg symptoms.

Hypnosis induced. Regressed to 4 years of age—started moaning—changed from English into Afrikaans—'Native groaning—Lorry ran over his back—Father and I riding in a car—There is a cloth over the Native—His leg is sticking out—We have passed it—(rather hastily) There is nothing more; please wake me up'—On waking, she said, 'Two I's flashed past twice. What did it mean?' (The anxiety to be awakened and the two I's suggested the proximity of further dynamic factors.)

Hypnosis induced. Regressed to 4 years of age again. I asked her whether it was her right or left side which was painful and she

* A paper presented at the South African Medical Congress, Pretoria, 1955.

answered, 'I don't know'. I pressed for an answer and she shook her right arm and leg and said, 'The pain is there' (This is consistent with true revivification for as a child of 4 years old, she could neither read or write, nor distinguish right from left.) 'What happened after passing the Native?' 'We were in a lorry'—then silence (this indicated resistance). 'Did you go home?' 'Oh yes! I remember now. When we got home, father was saying prayers. I complained of pains, when my little brother nudged me and said that I was bewitched and that the dead Native's pains had been transferred to me and would remain with me. I was terribly scared, because I believed this.' I asked her whether she saw the connection and she replied, 'No' (She was still 4 years old; how could she see the connection between this and the pains as an adult?—Further indication of true revivification.)

On waking, she remembered the details of the revivification, and replied, 'I can now clearly see the connection between the back pains and the experience at 4 years of age. I feel I am well now. It is all over'.

5 February 1955. Reaffirmed that her back pain was like toothache, and that the pains in the arm and leg were different. Asked whether she could associate anything with the II, II, she said that she did not have a clue, but there must be something to it.

Hypnosis induced. Asked what the 'II, II' meant—'There is a blackboard—II+II+8, written on it'. Regressed to 11 years. Stated that her mother was dead; the other II is her father's second wife; 8 stands for 8 o'clock (the time her father was killed)—'Her husband used a guttural R in his speech, just like her father'. She then saw her late father; became very upset; roused, still upset, and said that she did not want any more hypnosis as she did not want to see her father—it was very upsetting. Reassured that it was hallucinatory, she relaxed and was quite content.

This was the termination of the treatment. She had lost all her phobias, ate and slept well and was delighted with the results of hypnosis. When she contacted me a month later she was hale and hearty and maintaining her excellent recovery. Symptom-free up to the time of writing.

OTHER CASES

Mrs. Y, 27 years of age. Symptoms: Attacks of breathlessness with cold sensations of the extremities and profuse perspiration; irritability; unable to wear a collar blouse or anything covering her throat as it caused a choking sensation; a strong antipathy to sex.

26 June 1954. *Hypnosis induced.* Regressed to 6 years of age. When questioned about the origin of her sex fears, she said, 'She was with her younger sister when a man approached them and offered her chocolates to come with him into the bushes at the side of the road' . . . at this stage she gave vent to piercing shrieks and created such a din that the Matron and Sister rushed into the room to ascertain what was wrong. The screams continued—complained of intense pain, cried that the man was trying to insert his sex organ, terribly frightened and shouted, 'He is choking me'—felt her hands and legs go cold, sobbed bitterly and muttered that she was dying, and that everything was going dark—Then said she was dead and jerked convulsively.

3 July 1954. At the following visit she said: 'Now I know why I have choking feelings and feel as if I am dying—The man strangled me. I could never understand what had become of my little sister. Could never understand why I always used the phrase 'Wil nie veronreg nie' or why I experienced such a nasty smell when a man came near me. It is exactly the same smell as I experienced at 6 years of age. Whenever anything touched my throat, I always felt as if I were choking. I could only wear open-neck blouses. Look! I am wearing a high necked blouse and there is no discomfort'.

Up to the time of writing the patient is keeping well.

Mrs. F, aged 24 years. Amenorrhoea for 12 months, unaffected by intensive hormone therapy. It was suggested under hypnosis that her period would occur. Some days later, she experienced such a flooding that she panicked and called in her doctor. Further suggestions under hypnosis resulted in her having normal painless periods for the past year, except for 2 occasions.

Mrs. G, aged 50 years. Complained of pain and flooding at every monthly period since puberty, during which she was unable to get out of bed for 5 to 8 days. On admission for treatment for depression, she looked pale, wrinkled and ill. Menstruation had

just begun. It was suggested under hypnosis that her period would stop. She felt better on waking. Within a few hours there were only a few drops. She asked permission to go out with her husband in the afternoon, as she felt fine. There was no recurrence of the period that week.

Mrs. K, had had ENT and EST for depression. Despite a recent operation by a gynaecologist, penetration of the vagina remained impossible. After hypnotherapy she reported that sex relations were improving and voluntarily terminated the treatment.

Miss D, aged 26 years. Seen on 11 August 1954, she complained of nocturnal enuresis all her life. All medical treatment had been unsuccessful. After 12 hypnotherapies over a period of 3 months, she was continent, except for one or two occasions when she noticed her bedclothes slightly moist. Re-examined on 22 July 1955, she said she was now slightly moist once a month, except on one occasion after two cups of water at 12.30 a.m.

In 3 cases where sympatheticonics were given together with hypnotherapy, the results were not so satisfactory. One patient with asthma, hay fever, unresolved pneumonia and bronchitis, who was allergic to all the usual remedies, including penicillin, antibiotics and ACTH, reported that she had no further attacks of asthma after the first hypnosis. A second asthmatic emergency, also resistant to medication, responded to hypnosis.

Mrs. D, aged 24 years. Had been given Pethidine for the past 2 years for her intense headaches and vomiting. Of late she had had Pethidine twice a day and at night. She had given up all hope that doctors could do anything for her. After a few hypnotherapies the symptoms cleared completely. She was bright and cheerful.

Miss G, aged 17 years of age. On 14 February 1955, she was referred for attacks of unconsciousness. Symptoms: Attacks of unconsciousness, preceded by jumping spots, twitching, coldness of feet and hands; did not think that they were connected with emotional disturbances. These attacks had occurred over the past 2 years, but were of late preceded by twitching of the face and hands. Neurological signs were negative. Cool moist palms, nails bitten short. The differential diagnosis was between akinetic epilepsy and hysteria. It was decided to examine the patient under hypnosis. In the second hypnosis, she was regressed to the first attack. She exclaimed that her feet felt cold—she was worrying about her cousin drowning—realized the connection between the upset about the drowning and the attacks. Still in the trance it was suggested that she would have a dream—She dreamt that she had passed her matriculation examination, and was going to the Normal College to become a teacher. On waking, she realized the nature of the attacks. I mentioned that she would be able to take up her studies and become a teacher eventually. At this she showed obvious surprise. Wanted to know how I knew that she intended becoming a teacher. Her mother confirmed the drowning of the cousin. There was no evidence of physiological interruption of the consciousness in the attacks. Diagnosis of hysteria confirmed.

Miss D, aged 16 years. Referred for hysterical symptoms characterized by brief lapses of consciousness when she felt as if in a trance; immediately aroused if spoken to; insomnia, chest pains and neurasthenic symptoms.

Convulsions as a child. Unhappy childhood on account of an alcoholic father. Often involved in parental disputes. She was now unhappy at the technical college; felt that she had chosen the wrong subjects.

E.E.G. was abnormal, fitting in with an inter-seizure pattern of uncinate epilepsy. Interweaving of epileptic and functional elements presented a confusing picture.

Whereas she had always been abrupt and short in describing the attacks, under hypnosis she proceeded to give more details than she had ever given before, as follows: 'Dit voel as of ek nie lewendig is nie—Dit is alles in my kop—Dit voel as of dinge om my nie werklik is nie—Dit voel as of ek aan die slaap is—Ek voel as of ek nie regtig lewe nie' continued that these dead feelings began 2 years ago.

There was complete amnesia for the hypnosis, and she volunteered that it felt like going out under chloroform.

Mr. J.B., epileptic, aged 40 years. Referred for impotence, which had gradually developed. He was unable to maintain an erection, nor did he have any sex desires. He had been taking pills for epilepsy since 19 years of age. His memory was so bad

that he had to make a note of everything. Whenever he was questioned under hypnosis, and brought to the moment preceding the attack, he consistently reported a blank (indicative of physiological interruption of consciousness).

Under hypnotherapy his memory improved and potency returned; he impregnated his wife of 40 for the first time.

(According to the test-books the more extensive the retrograde amnesia, the more extensive the trauma. Amnesia persisting for years is assumed to be the result of irreversible brain damage. Hypnosis may throw more light on the pathology of this type of injury.)

Mr. B., aged 21 years. Referred on 19 August 1941. He was involved in an accident on 13 May 1941; hospitalized for 5 weeks. He said that he had been unconscious for 18 hours. His memory for the first week was vague. His last memory was of driving a car at 12 p.m. According to the police reports, he drove a motor cycle into a car at 2 p.m. There were no signs of organic lesion of the CNS.

On 13 May 1953 he was admitted for alcoholism. He had been in many nursing homes, including 'Tara' where he had had a lumbar puncture and radiological examination of the skull, with negative results. The one thing that worried him was the retrograde amnesia of 2 hours. He had frequent dreams about the accident. He asked whether it was possible to restore his memory of the accident.

At the 7th hypnosis, he was regressed to the date of the accident. Up to now the conversation had been in English, but in the regression he switched to Afrikaans. Gave the following account: He was driving down from the Union Buildings on the winding road. The oncoming car was on his wrong side of the road, cutting the corner. (The patient became very agitated at this stage evidently re-living the accident.) He said, 'He was driving down hill—could not stop—struck the car broadside on. He had complete amnesia for the duration of the trance. After details were repeated to him he said that this confirmed the police report and sketches. He appeared relieved.

HYPNO-ANAESTHESIA

Mr. C., 30 years of age. During a course of hypnotherapy for psychoneurosis the patient arrived for an appointment and stated that his shoulder movements were painful as the result of his spraining his shoulder. Hypno-anaesthesia was induced in the shoulder joint. On waking he was surprised to find that he could move his shoulder freely and painlessly. Hypno-anaesthesia was left. On his next appointment a week later, he stated that his shoulder had remained 'dead' for a few days, and then the dead feelings had worn off, accompanied by a few prickly feelings.

Mrs. C., aged 41 years. Referred for electro-narcosis with the warning that she was sensitive to Luminal. The day after treat-

ment with Pentothal, Flaxedil and ENT there was swelling of the right breast and right side of arm and an itchy rash on the body, mostly in the groins and folds of the breasts (she was allergic to barbiturates). Hypnosis was substituted for Pentothal, though the patient was afraid it would not 'put her deep enough'. Questioned afterwards, she stated that she did not feel the needle inserted; it felt like going under Pentothal, except that it made her 'more squiffy'. With the same ENT current the patient went deeper after Hypno-anaesthesia. No further urticarial reaction occurred.

Mrs. P., aged 24 years, was having hypnotherapy for psychoneurosis. There was a disfiguring mole in the left nasolabial fold, which she would not have removed because she was afraid that she would never wake up from the anaesthesia. There was a similar phobia for hypnosis. After successful induction of hypnosis, she expressed her willingness to have the mole removed under hypnosis. Arrangements were made for Dr. Schulenberg to operate.

On 5 November 1954 Dr. C. A. R. Schulenberg operated. The patient was hypnotised on the operating table and hypno-anaesthesia of the face induced. She drew up her nose when the area was cleansed with ether. There was no flickering of the eyelids nor any signs of discomfort with the cutting and stitching, although this is a very sensitive area. On waking after the operation, she doubted that the mole had been removed, and wanted to take off the dressing to reassure herself. Said that she had experienced a nasty smell when the face was swabbed, and wondered whether she would feel the knife cutting. There was no discomfort with the operation. Anaesthesia was left until the removal of the stitches 4 days later. The patient was so pleased with the result that she expressed a wish to have a parotid tumour removed in the same way.

CONCLUSION

In attempting to cover a wide field many significant details have been omitted.

Hypnosis may be regarded as a scientifically established fact. In its application, the directness and economy of effort and time are impressive to both patient and doctor.

It offers a rich and promising field for further investigation and research, and should be confined to those subscribing to a recognized ethical code and standard of qualification. Steps should be taken to prevent public displays by lay hypnotists. The future tempo of hypnosis may depend more on how we control than how we practise.

NEW FACTS AND OLD MISCONCEPTIONS ABOUT NEUROSES*

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THE FACTS

The new facts about the neuroses that I wish to present are of two inter-related kinds—experimental and clinical. In the perspective given by these new facts several popular notions will be seen to be misconceptions.

Many medical men are still unaware of the fact that neurotic states can be produced experimentally. Yet, since Pavlov⁵ reported the first instance of experimental

neurosis in a dog, nearly half a century ago, neuroses have been produced by numerous experimenters in many different species ranging from pigeons to chimpanzees and even human beings.

About 8 years ago I performed a series of experiments on cats on the production and therapy of neuroses.^{7, 8} A very significant finding was that a neurotic state could be produced merely by subjecting an animal confined in a small cage to an uncomfortable but non-damaging electric shock. At the time of being shocked the animals displayed anxious behaviour such as howling, muscular tenseness, mydriasis and tachypnoea. This behaviour was subsequently reproduced whenever the animal was

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brought back into the experimental cage even after many months, although the animal was never again shocked. The anxiety was also manifested in the experimental room outside the experimental cage, and in varying degrees in certain other rooms according to their degree of resemblance to the experimental room. It was concluded that experimental neuroses are essentially conditioned anxiety-reactions of high intensity.

The anxiety reactions of our animals were regularly overcome in the following manner. In the experimental cage where the shocks had been administered the animal would on all future occasions have so much anxiety that he would refuse to eat meat pellets dropped in front of him even if he had been starved for two or three days previously. But if attempts were now made to feed him in the other rooms resembling the experimental room, some room would be found where the anxiety would not be great enough to inhibit feeding. If the animal was repeatedly fed in this room, it was found that he ate with increasing readiness there and thereafter began also to eat in a room more closely resembling the experimental room. Progress was made from room to room until the animal would eat in the experimental room and at last in the experimental cage, eventually showing no trace of anxiety there.

Immediately preceding the neurosis-producing shocks a buzzer or other auditory stimulus had been presented. This had thus also become conditioned to evoke anxiety responses, and continued to do so even after the animal had ceased to respond with anxiety to the visual and olfactory stimuli. By a procedure of gradual approaches analogous to that used for the visual stimuli the anxiety-evoking effect of the auditory stimulus was also gradually eliminated.

These findings led to the general hypothesis^{8, 9, 12} that if a response incompatible with anxiety can be made to occur in the presence of anxiety-evoking stimuli it will weaken the bond between these stimuli and the anxiety responses. This hypothesis of reciprocal inhibition as the usual basis of psychotherapeutic effects has been directly confirmed clinically by the use of the following responses that are antagonistic to anxiety—assertive responses, sexual responses, and relaxation. There is reason to believe that respiratory and musculoskeletal responses are under certain conditions also antagonistic to anxiety.¹¹

The hypothesis is most conveniently illustrated by a method employing relaxation responses. The patient is given preliminary training in relaxation by Jacobson's method.² Meanwhile an 'anxiety hierarchy' is constructed. This is a list of stimuli to which the patient reacts with unadaptive anxiety. The items are arranged according to the amount of disturbance they cause, the most disturbing items being placed at the top and the least disturbing at the bottom. The patient is hypnotized and made to relax as deeply as possible. Then he is told to imagine the weakest item in the anxiety hierarchy—the smallest 'dose' of phobic stimulus. If the relaxation is unimpaired by this a slightly greater 'dose' is presented. The 'dosage' is gradually increased from session to session, until at last the phobic stimulus can be presented at maximum intensity without impairing

the calm, relaxed state. It will then be found that the patient has ceased to react with his previous anxiety in encounters in real life with even the strongest of the once phobic stimuli. The following specimen list shows two hierarchical series of anxiety-evoking stimuli (in descending order) obtained from a single patient:

- A
 1. Human injuries with a good deal of bleeding.
 2. A clothed dead body.
 3. A dead body completely enshrouded.
 4. Slight bleeding from own child's minor wound.
 5. At a burial.
 6. A severe bloodless injury, e.g. large wound, fracture.
 7. Inside a cemetery.
 8. Seeing a funeral procession.
- B
 1. Speaking among strangers.
 2. Being focus of attention in group of 6 or more acquaintances.
 3. Being alone with one woman: (a) stranger, (b) acquaintance.
 4. Being alone with 2 or more women: (a) strangers, (b) acquaintances.

It should be noted that the items in list A are not homogeneous, and could be separated into 2 series—a death series and a trauma series; but they do have an obvious common core, and the reactions they evoked in the patient had the same feeling-quality. When these lists were worked through systematically in the manner described above, the patient became free from any anxiety reaction when he encountered in real life any of the stimuli listed.

The results of treatment of 122 cases by de-conditioning on this principle of reciprocal inhibition were published a short time ago,¹¹ an earlier report on the first 70 cases having appeared in this Journal.¹⁰ Using as an index Knight's 5 criteria³—symptomatic improvement, increased productiveness, improved adjustment and pleasure in sex, improved interpersonal relationships, and ability to handle ordinary psychological conflicts and reality stresses—it was found that 110 cases (90%) had been either apparently cured or much improved after an average of about 25 interviews. This compares strikingly with the 50–60% of successes obtained in most other series, including psycho-analytic series. Reasons were given¹¹ for believing that all of these other series also owed such successes as they obtained to reciprocal inhibition of anxiety responses, due to the non-specific emotional responses that are evoked in patients by *any* kind of 'psychotherapeutic' interview. If the relatively favourable results of the reciprocal inhibition series are, to the extent of 60%, regarded as also due to non-specific emotional arousal, the additional 30% of good results may be attributed to the use of special measures to obtain reciprocal inhibition of anxiety.

THE MISCONCEPTIONS

It is clear from the foregoing that neuroses are basically conditioned anxiety-reactions. Their arousal is automatic once they have been conditioned, and they persist until the conditioning has been overcome by relevant emotional retraining procedures. Armed with this meaningful and clear conception, we are able to see clearly the erroneousness of many popular notions about neurotic states. We may group these notions under

3 headings—(a) misconceptions about the nature of neuroses, (b) misconceptions about the approach to the patient, and (c) misconceptions about therapy.

Misconceptions regarding the nature of neurosis

Probably the most widespread misconception under this heading is that neuroses are purposive—that a person either deliberately or unconsciously adopts a neurosis because it subserves some aim, usually that of enabling him to evade his problems. Now, as we saw that neuroses can be understood in terms of cause and effect, to invoke an additional concept like purpose is superfluous, just as it would be superfluous to invoke the intervention of angels to explain how apples fall to earth when dropped.

Another false idea regarding the nature of neuroses is that they constitute a state that is somewhere between normality and psychosis. This is untenable because neuroses are a matter of conditioning (i.e. learning)^{1,2} whereas psychoses are apparently due to biochemical and other physiological abnormalities. I personally have never seen a neurosis turn into a psychosis, and Eysenck¹ has recently shown in a statistical study that neuroses and psychoses do not belong to the same continuum.

Misconceptions regarding the approach to the patient

There are two common misconceptions that fall under this heading. The first of these is still cherished by a good many doctors. It is that the neurotic is really not ill but just misbehaving, and that once it is certain that there is no organic disease the patient can safely be forgotten (except for a bottle of sedative when he is a nuisance). Yet neurotic suffering is particularly unpleasant to endure, and patients frequently say that they would prefer even severe pain from organic disease. Like all other conditioned responses neurotic responses are automatic and not produced by the patient's free will.

The other ill-conceived approach to the neurotic patient has something in common with the foregoing. The doctor assumes that the patient's troubles are all due to his concealment of unpleasant facts. Consequently the interview situation acquires the character of a battle of wits between the doctor and the patient or the patient's so-called 'unconscious mind'.

Misconceptions about therapy

Misconceptions about therapy of the neuroses are very numerous. Now, fortunately, even the therapist with the most erroneous ideas can expect to achieve a substantial percentage of successes because, as I pointed out earlier, there are non-specific emotional effects of interviews that lead to de-conditioning of neurotic responses, no matter on what theory the interview is conducted. But the erroneous ideas are none the less undesirable and should be exposed. Here are some of them:

1. '*Time heals*'. This notion is untrue if taken literally, yet contains a germ of practical truth. The mere passage of time does not affect neurotic or, for that matter, other conditioned responses, yet sometimes a patient improves with time just because chance provides circum-

stances which permit reciprocal inhibition of the neurotic responses to occur.

2. '*Talking it out*'. Another wrong idea that also often leads to successful therapy is that by 'talking it out' a patient may purge himself of his neurosis. Neurotic reactions do not fly out on the wings of the words by which the patient describes his troubles, but sometimes, if he is lucky, in the course of his description the anxieties aroused may be reciprocally inhibited by other emotions that arise from the therapeutic situation itself.

3. '*Show him how absurd his neurosis is*'. In this approach the doctor proves to the patient by logic that his fears are baseless and therefore shouldn't exist. The patient accepts this intellectually (and in fact may have been aware of it already) but usually his fears continue. It is not to be expected that emotional responses whose conditioning involves automatic subcortical centres will be much affected by changes in the patient's intellectual content.

4. '*Moralistic injunctions*'. Some doctors have the idea that a neurosis is essentially due to a lack of a mystical entity called 'moral fibre'. Therapy accordingly consists of 'pepping up the patient'. This is attempted sometimes by means of a bluff manner, but more often by means of moralistic injunctions of which the following are popular examples—'You must face up to your troubles', 'Only you can help yourself', 'Pull yourself together, man', 'Do you realize how unfair to your family your behaviour is'. Such moralizings can never have the slightest beneficial effect on the conditionings that underlie a neurosis. On the contrary they sometimes make the patient worse through giving him feelings of guilt and inadequacy, especially if he has been frantically trying to follow the meaningless advice to 'pull himself together'.

5. '*Repression-lifting*'. The notion that the lifting of repressions is the essence of psychotherapy is probably the most serious of all therapeutic misconceptions, because it is held by many sophisticated therapists. The peculiarly persuasive way Freud had of presenting a case even when it was not backed by scientific proof is the main reason for this state of affairs. Yet, typical statistical studies^{4, 6} show that psycho-analytic methods do not even achieve results superior to those of ordinary hospital practice (because both depend on the non-specific anxiety-inhibiting emotional effects of interviews).

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ASSISTED CIRCULATION*

VERNON WILSON, M.D. (CAMB.), M.R.C.P. (EDIN.)

Department of Surgery, University of the Witwatersrand, Johannesburg

Dr. Wilson represented the Cardiac Surgical Research Unit attached to the Department of Surgery of the University of the Witwatersrand. This Unit was formed 3 years ago with Mr. G. R. Crawshaw, thoracic surgeon, Dr. K. B. Vetten, anaesthetist and Dr. V. H. Wilson, physician, and has been supported by the Nuffield Foundation. He reported that Mr. L. Fatti had been closely associated with this work; Dr. K. H. Foord, anaesthetist, had studied the problems connected with the artificial circulation; Dr. P. A. H. Klocker has been associated during experiments with refrigeration, Dr. L. Kreel with electrocardiography, and Dr. H. Rudinsky with the estimation of blood-oxygen saturation and the CO₂ combining power of the blood; and Dr. W. J. Pepler, pathologist and Dr. W. M. Politzer, biochemist, had also given their services.

The ultimate purpose of the Unit's investigation was to explore the possibilities of correcting incompetence of the mitral valve surgically. For this a dry left ventricular cardiomy was required to allow detailed study of the chordal attachments of the mitral valve and the mobility of the cusps. These requirements demanded that cardiac surgery could be performed without time restriction and with the same confidence as other well-established operations upon the chest, such as pulmonary resection, and with an operative mortality of less than 10%.

In addition therefore to the study of the anatomical and functional disturbance of the incompetent mitral valve, 50 dogs had been specifically used to study the control of heart action and the behaviour of the circulation during attenuation and arrest in relation to ventricular cardiomy, with and without artificial forms of circulatory maintenance. Studies in pharmacology, pressure and ECG recordings, the O₂ saturation and CO₂ combining power of the blood, and other forms of biochemistry and pathology had been undertaken.¹⁻⁵

Two forms of artificial circulatory maintenance had been studied:

1. Cross perfusion between two living organisms.
2. The artificial heart-lung pump.

In these the arterial system of the subject was perfused with blood at sufficient pressure to close the aortic valve and to maintain viability of tissue, whilst venous blood was withdrawn from the subject by catheters in the vena cava to prevent blood entering the heart and lungs. The Unit had found that the two main difficulties in applying the extracorporeal circulation had been (a) the use of heparin to prevent clotting of blood in the artificial system and its connections, and (b) the difficulties in withdrawing blood artificially from the veins.

CROSS PERFUSION

To offer hope for heart surgery unrestricted by time, an experiment in the cross perfusion between two dogs was presented. The photograph of the operating theatre was shown, illustrating the organization required, with the junction machine between the two animals consisting of catheters, venous and arterial booster pumps, and a 4-channel apparatus for recording pressure and ECG to control the general condition of the animals. During the experiment the Donor maintained the general condition of the Recipient, who had a thoracotomy and left ventricular cardiomy. The Donor supplied blood by a polythene catheter from one femoral artery to the subclavian artery of the Recipient, which returned blood from its femoral vein to the same vein of the Donor. In the Plate (Fig. 1) a series of records of the ECG and systemic arterial pressures of the Recipient and the Donor illustrated the progress of the experiment. Tracing 1 showed the ECG and systemic arterial pressure of the Recipient before thoracic surgery was started and before perfusion by the Donor. Tracing 2 showed the Recipient's records during the cross perfusion and illustrated the serious fall in the carotid pressure soon after the inferior vena cava was clamped.

* Report of Address given at the South African Medical Congress, Pretoria, October 1955.

Tracing 3 showed the ventricular fibrillation which occurred soon after, and also the carotid pressure of the Recipient supplied by the Donor. Dr. Wilson considered that ventricular fibrillation remained a serious complication. The Unit had found that the most important single factor in the causation of ventricular fibrillation was a serious fall in the systemic arterial pressure, whatever its cause, be it loss of blood volume, refrigeration, neurogenic shock, or rotation of the heart upon its venous return. Ventricular fibrillation can be suppressed—and suppressed it must be before heart beat can be re-established—by electrical defibrillation and chemical means in 75% of cases and, if controlled soon enough, the patient's life saved in some. In this experiment the electrical defibrillator and various poisonous quantities of potassium, magnesium and quinine dihydrochloride, failed to stop the ventricular fibrillation of the Recipient, which continued for 52 minutes. During this period, left ventricular cardiomy upon the Recipient showed a dry left ventricle without evidence of clot. Finally 20 c.c. of $\frac{1}{2}$ mEq potassium chloride injected directly into the coronary system of the Recipient arrested the ventricular fibrillation, soon after which the heart action returned spontaneously (Tracing 5). Later, sinus rhythm and a good systemic blood pressure was established with the Donor disconnected (Tracing 6). Tracing 4 showed the Donor's records during perfusion. The recovery of the Recipient's heart to provide a carotid pressure and maintain breathing and corneal and gag reflexes after 52 minutes of ventricular fibrillation, in spite of poisonous substances injected into the coronary system, encouraged belief in artificial circulatory methods and hope for heart surgery without time restriction. Further experiments on cross perfusion, however, demonstrated some serious dangers for the Donor dogs, so as to make the team feel that this method was prohibitive at present for human application.

ARTIFICIAL HEART-LUNG PUMP

With regard to the artificial heart-lung pump, the Unit had studied the Jongbloed and Brinkman machines. The demonstrations in which Dr. Wilson and Mr. Crawshaw assisted in the laboratory of Professor Jongbloed in Holland encouraged them to accept his machine as practical. Dry heart-surgery was possible with a well-maintained intermittent arterial pressure and cardiac output of 4 litres per minute by a compact and simple machine without biochemical problems or difficulties in maintaining venous return from the body. Its disadvantage was the heparinization required of the animal's blood volume and the 4 pints of blood needed to fill the dead-space of the machine. Dr. Wilson considered that as the effects of heparin are unpredictable and its neutralization uncertain its acceptance by the surgeon was difficult at present. The Unit had found, for instance, that whereas one animal had bled to death in $\frac{1}{2}$ hour with 10,000 units of heparin during thoracotomy, another showed no signs of bleeding with 50,000 units. Furthermore the effects of heparin had been found sometimes to be delayed so that during operation, even though no signs of bleeding had been observed, the animal had died some hours later from a fatal haemorrhage unrelated to surgical technique. On account of this and the expense of the Jongbloed machine the Brinkman machine was purchased. The Brinkman theoretically overcame the heparin difficulty by siliconization of its surface; in practice this was not found to be fool-proof. Furthermore the vibration pumps, although most ingenious, were subject to break down and were difficult to adjust; venous return was also difficult to maintain.

In the experience of the Unit the extracorporeal circulation cannot yet provide ideal conditions for open cardiomy, namely surgery unrestricted by time, with an immediate mortality of less than 10%. When the mechanism of bleeding and clotting was fully understood and controllable, the Jongbloed machine, which imitates physiological condition by intermittent pumping, would provide satisfactory conditions.

The purpose of Dr. Wilson's paper was to show that a sincere attempt was being made to understand the basic principles and difficulties of the artificial and arrested circulations; to explain why the extracorporeal circulation was still considered to be

experimental, and to give hope that the ideal would be realized, so that major surgery one day would be possible upon the heart, which potentially was very good material for this work.

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CRETINISM : CASE REPORT AND DISCUSSION*

M. I. PAPILSKY, M.B., Ch.B., D.C.H.

Queenstown

As a general practitioner who sees a large number of children I have, during the last few years, come across many interesting cases. I have decided that it would be more interesting to select one of these patients and discuss the condition from which he is suffering than to talk on an abstract subject purely of academic interest.

CASE REPORT

The child was first seen at the age of 5½ months. He was the product of a healthy pregnancy and a normal confinement, weighing 6½ lb. at birth. The mother was a primipara aged 25 years, and there was no consanguinity between the parents.

All seemed to go well until the age of 4½ months, when the mother observed that the child was becoming obstinately constipated. He was breast-fed and the mother was not at first unduly alarmed by this symptom and did not seek advice. It is, as we know, not unusual or abnormal for a breast-fed child to defaecate

3. The complexion is pale and sallow.
4. The eyelids are heavy and the palpebral fissures narrowed.
5. The nose is squat and the lips thickened and negroid in appearance, with the tongue protruding from the mouth.

Other features present were large supraclavicular pads of fat, a protuberant abdomen and a small umbilical hernia. There was nothing remarkable about the heart, lung fields, E.N.T., etc. The length of the child was 22½ inches (the normal at 6 months is about 26 inches).

I was impressed with two other features in this case, viz.:

1. The extreme dryness of the skin, and
2. The hypotonicity of the musculature. One could twist the limbs into most peculiar positions with no discomfort to the child. (The protuberance or distension of the abdomen is due to the lack of tone in the abdominal musculature.)

On direct questioning the mother, strangely enough, said she had noticed nothing unusual about the baby and stressed what a good child it was. Incidentally, it behoves one always to be suspicious about any infant proclaimed to be very good, and to think of mental deficiency or serious illness. However, despite the alleged good behaviour of the child, it cried when I examined it and I was given the opportunity to hear the hoarse, croaking, bullfrog-like voice of the cretin.

One final observation at the initial examination was that the child was unable to support his head (which a normal child can do at 3 months) and had not yet smiled (which a normal child does at 6-8 weeks). So here was a child at 6 months, definitely retarded mentally and physically, and looking very dull.



Fig. 1. Cretinous child aged 6 months, 5 April 1955 (before treatment).

only every second or third day. However, this child was worse than that, and when there was no response to the usual household remedies she brought him along to me. On inspection I saw that the child was a typical cretin (see Fig. 1). The clinical picture was characteristic and I hope you will pardon me if I describe the patient rather fully, for one does not see these cases frequently in general practice.

From the head downwards the following are the main features:

1. The hair is scanty, coarse and wiry.
2. The fontanelle is still wide open, whereas normally in a child of this age there ought to be some sign of closure.

* A paper read at a meeting of the Queenstown Division 26 April 1956.

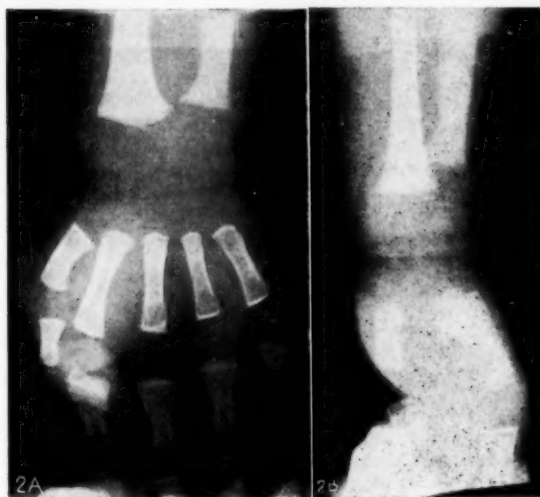


Fig. 2. A and B. Skiagrams of wrist of same cretinous child aged 6 months (before treatment), showing no ossification of carpal bones.

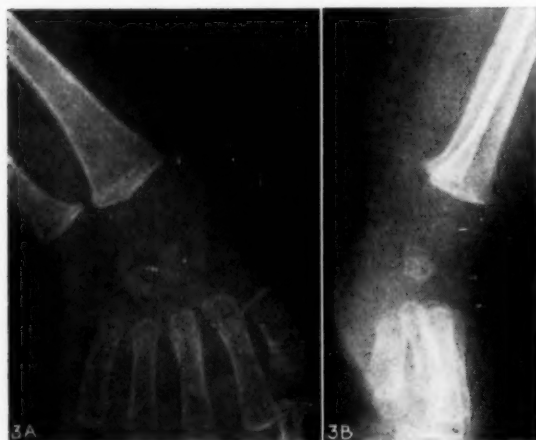


Fig. 3. A and B. Skiagrams of wrist of normal child aged 6 months, showing ossification of carpal bones.

Because of expense and distance from the laboratory, the chemical test carried out was the blood Cholesterol, which was 600 mg. %.

The X-ray of the wrist (Fig. 2) is interesting and when it is compared with the appearance in a normal child aged 6 months (Fig. 3) one can see how retarded the bone age is by the fact that the small bones of the wrist are entirely absent in the patient, whereas two are normally present at this age.

The child was put on thyroid immediately and the developmental pattern has since been completely normal, the child sitting without support at 8 months, standing at 1 year and walking well



Fig. 4. Same child aged 13 months, 25 November 1955 (after treatment).

at 17 months, which are all well within normal limits. His appearance at 13 months (Fig. 4) is that of a normal child who is perhaps rather fat. The dryness of the skin disappeared after 2 months of treatment and his cry became normal.

DISCUSSION

I should now like to say something about the etiology, treatment, prognosis and differential diagnosis of cretinism.

Etiology

In the majority of cases the condition is sporadic and is due to partial or complete agenesis of the thyroid gland. I suppose one could call it a congenital deformity. Occasionally rudimentary thyroid tissue, which may possess some degree of activity may be found in the tongue or neck. There is, then, no thyroid gland present, and nothing to perform thyroid function, which is to synthesize thyroxine. It has been estimated that only 50 micrograms of thyroxine a day are necessary to maintain normal health. Without thyroxine the infant is unable to grow physically or

mentally and the picture of cretinism evolves. The condition does not become apparent in the first few months of life because the foetus inherits enough thyroid hormone to supply its needs for about 3-4 months. There may also be some hormone supplied by the secretion of a rudimentary gland, as mentioned above. It has been suggested that thyroxine can be transmitted post-natally in the breast milk.

Another cause of sporadic cretinism is deficiency of anterior pituitary thyrotropic hormone.

Sporadic cretinism is not hereditary and there is no fear that a subsequent child will be similarly affected, although there is one report in the literature of 3 siblings of Mexican descent born in 3 successive pregnancies and all afflicted. One can, however, reassure the parents that they need not fear another pregnancy.

Endemic cretinism is a different type of condition. It occurs in areas where goitres are common, owing to local deficiency of iodine, and may, naturally, affect more than one member of a family. This occurs in parts of Switzerland, Austria and Spain. In these cases the lack of thyroxine is due to iodine deficiency, and the treatment is to give iodine.

I should like to stress that what I have mentioned is by no means an exhaustive description of the possible etiological factors and does not embrace all the facets of thyroid endocrinology.

Treatment

Fortunately this is simple and merely consists of administering tablets of dry thyroid (B.P.). The preparation is cheap, and no other hormone can be relied upon to exert such profound benefit when given by mouth.

The initial dosage must be small and, in the present case, $\frac{1}{2}$ gr. daily was administered. Care must be taken in increasing the dosage and additions must be made gradually, usually by adding $\frac{1}{2}$ gr. every 14 days. The optimum dose for the individual case must obviously vary, but 1-2 gr. a day is aimed at.

An easy guide to dosage is the state of the bowels. I found that in this case when I pushed the dose up to 1½ gr. the child developed diarrhoea and became irritable. If too little is given the patient remains constipated and does not develop. At present the patient is doing well on 1 gr. a day, but as he gets older I shall gradually increase the dose. Other signs of overdose are those of hyperthyroidism, which in a child would manifest itself as tremors, tachycardia and persistently bad behaviour.

Blood-cholesterol estimations at regular intervals may be of help in grading the amount of thyroid to be given. The blood cholesterol in this case was 160 mg. % in February 1956.

There are more elaborate tests, such as the estimation of protein-bound iodine and radio-active iodine studies, but these are expensive and impossible to do here. The basal metabolism rate is also difficult to determine in a child, for a large measure of cooperation on the part of the patient is essential in carrying out the test and one cannot expect this in a young baby.

It is of paramount importance to find the correct dose for the particular case; too much at the beginning of treatment may be fatal, and too much later on will interfere with the development of the child's personality and the most efficient use of the available mental capacity.

Prognosis

The longer the delay in diagnosis and the commencement of treatment, the worse the outlook. Congenital cretinism is a rare condition and there is some excuse for missing the diagnosis. Within 3-4 weeks after the commencement of therapy the metamorphosis begins and after a few months of treatment it is impossible to recognize the child as a cretin. There I should like to stress that in a child where growth has ceased, whether as the result of cretinism or of any other disease (e.g. pink disease or coeliac disease), when recovery takes place and growth proceeds rapidly it is essential to ensure that adequate vitamins are given, particularly vitamin D. Rickets will not occur in a marasmic child, but only during the recovery phase.

If the diagnosis is not made until the age of 2½-3 years, one may still get some improvement in the physical appearance, but the child will remain a mental deficient and a dwarf.

One cannot improve the intellect by pushing the dose of thyroid higher than is required to maintain normal metabolism. According to reports, some cretins have been able to win scholarships at school and some have grown up with severe mental retardation despite adequate and continuous treatment.

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cretins whose mental development under treatment is normal. Judging by the milestones to date there is no departure from the normal. Physical development, in a case like this, one can expect to be normal. Treatment must be continued throughout life.

Differential Diagnosis

During the last few years I have seen several cases of mongolism in infants who have been on treatment with thyroid in the erroneous belief that they were cretins. (There is no treatment for mongolism; glutamic acid had a vogue a few years ago, only to fail miserably.) The following are the main differential points:

1. The hair of the mongol is soft and of fine texture, that of the cretin wiry in nature.
2. The eyelids of the mongol are widely separated and the eyes slope upwards and outwards.
3. The complexion of the mongol is usually bright and pink, in contrast with the butter-coloured cretin.
4. 10% of mongols have associated congenital heart-disease.
5. Finally mongolism is recognizable at birth. In a difficult case blood-cholesterol levels will help, and also X-rays to determine the bone age which is retarded in the cretin and not in the mongol.

RIGHT OF THE DOCTOR TO DISPENSE: ACTION TAKEN BY THE MEDICAL ASSOCIATION

Dr. A. H. Tonkin, Secretary of the Medical Association has, under date 1 June 1956, addressed the following circular letter to Honorary Secretaries of all Branches and to Federal Council Members for information on the question of Dispensing by Doctors.

As will be known to most members of the Association through the daily press, a series of amendments to the Medical, Dental and Pharmacy Act had been drawn up on the instructions of the Minister of Health. These included an amendment to Section 73 in which the rights of medical practitioners to dispense their own medicines were set out. The original amendment was designed to forbid all doctors practising within 5 miles of a municipality in which a chemist carried on his business, to 'compound or dispense or supply' medicines for their patients. Should they live in an area outside these limits, they would be entitled to dispense, provided they obtained a special licence to do so. A proviso to the prohibition allowed a doctor to dispense or supply medicines in an emergency.

This matter was brought to the notice of the Association by the Executive Committee of the South African Medical and Dental Council, and contact was immediately made with the Secretary for Health who, it must be pointed out, has been most helpful to the Association at all times during this present controversy.

Representatives of the Medical and Dental Council met the Minister for Health, and the views of the Association were meanwhile conveyed to him by the Secretary for Health. The Minister

removed the offending amendment and when the Draft Bill was published it was not included. The Minister, however, indicated that in view of certain commitments which had been made, he would be prepared to accept for discussion by the House an amendment to Section 73 if it was proposed by a private Member, and that he would leave the decision regarding such an amendment to an open vote of the House.

On various occasions the Secretary of the Association has called at the House of Assembly and interviewed Members of Parliament who are colleagues, and on one occasion accompanied by the Chairman of Council a further interview took place. A memorandum containing the views of the Association, as expressed in a voluminous correspondence from certain Branches and individuals, was handed to a representative on each side of the House for distribution to those who would take part in the debate and support the point of view of medical practitioners by opposing the amendment.

Subsequently, members of the Executive Committee of Federal Council resident in Cape Town interviewed the Minister of Health and made clear to him the opposition of the Association to any attempt to curtail a practitioner's age-old right to dispense his own medicines.

The Pharmaceutical Society of South Africa has been extremely active in canvassing Members of Parliament, but it is considered that their form of propaganda may do more harm than good. We are assured of strong opposition to the proposed amendment, which will undoubtedly be put forward by a private Member of the House.

This statement is sent to you in order that you may inform the members of your Branch, if it is so desired.

MEDICAL, DENTAL AND PHARMACY AMENDMENT BILL, 1956

The following is an abstract from the Bill, which was given a first reading in Parliament on 29 May:

Section 1. Section 23 of the Medical, Dental and Pharmacy Act, 1928 (hereinafter referred to as the principal Act) is hereby amended—

(a) by the substitution for sub-section (1) of the following sub-section:

'(1) Any South African citizen who—

(a) is a South African citizen by birth or descent; or

(b) was domiciled in the Union when he commenced his professional studies and proceeded therefrom for the purpose of prosecuting those studies, may, if he has obtained a degree, diploma or certificate not prescribed under subsection 22, but which is prescribed under sub-section (3) of this section, be registered as a medical practitioner or dentist, as the case may be; and

(b) by the deletion of sub-section (2).

The effect of clause (a) is to change the application of section 23(1) of the principal Act from 'British subjects' (born or domiciled in the Union) to 'South African citizens' (by birth or descent or domiciled in the Union). Otherwise section 23(1) remains unchanged. Section 23 (2) applies only to dentists.

Section 2 of the Bill has a similar effect to that of section 1 in amending section 28 (1) of the principal Act, which relates to chemists and druggists only.

Section 3. Section 47* of the principal Act is hereby amended by the addition thereto of the following sub-section, the existing section becoming sub-section (1):

'(2) Any rules made under paragraph (e) of sub-section (1) of Section 94* may provide that failure to comply with any requirement thereunder relating to the acceptance by a medical practitioner of dentist of any professional appointment, including the submission to the council of any document relating to such appointment, shall for the purpose of sub-section (1) of this section constitute an act of which the council may take cognizance under this Chapter'

Section 4 of the Bill amends section 61 of the principal Act (which prohibits the production, import, export and traffic in habit-forming

*** Section 47 imposes on the Medical and Dental Council (and the Pharmacy Board) the duty of prescribing the acts or omissions of which the Council (or Board) may take cognizance, and section 94 (2) (b) empowers the Council (or Board) to make rules concerning such acts or omissions.**

drugs) so as to prescribe heavier penalties for offences, and in particular for offences relating to dagga.

Sections 5, 6 and 7 of the Bill amend sections 65bis, 71 and 72 of the principal Act (concerning habit-forming drugs).

Sections 8 and 9 of the Bill amend sections 76 and 76bis of the principal Act (which relate to the conditions under which a body corporate may carry on business as a chemist and druggist).

Section 10. The following section is hereby substituted for section 83bis† of the principal Act:

83bis. (1) The Minister may after consultation with the council, make regulations—

- as to the licensing of persons or organizations which undertake the withdrawal of whole blood from human beings or the storage, testing, processing or supply of such blood for use either as whole blood or in the form of specified preparations separated therefrom for therapeutic or prophylactic purposes in human beings;
- prohibiting the undertaking by unlicensed persons or organizations of any of the acts which licensed persons or organizations are in terms of any such regulations permitted to undertake;
- prescribing the conditions under which licensed persons or organizations may withdraw whole blood from human beings or store, test, process or supply such blood or preparations as aforesaid for the aforesaid purposes and the records which shall be kept by such persons or organizations in relation thereto;
- providing for the inspection by any person authorized thereto by the Secretary for Health, of the staff employed and the premises, equipment and methods used and the records kept by licensed persons or organizations;
- prescribing requirements as to—

- the taking by any person authorized thereto by the Secretary for Health, or the submission by any licensed person or organization, on the request of the licensing authority, of samples of whole human blood or preparations separated therefrom or of any testing reagent or other material used in the preparation of such whole human blood or preparation prepared by such person or organization or by any other licensed person or organization;
- the submission to the licensing authority, upon request by it, of the protocols in respect of any test which licensed persons or organizations are, in terms of regulations made under this section, required to carry out in connection with the preparation of whole human blood or preparations

separated therefrom or testing reagents or other material as aforesaid;

- requiring a medical practitioner who infuses whole human blood or preparations separated therefrom into a patient, to report forthwith to the licensed person or organization which supplied such blood or preparation, any abnormal reaction or death which occurs in the patient as an apparent result of such infusion;
- providing for the withdrawal or suspension of a licence issued to any person or organization which contravenes or fails to comply with the provisions of any regulation made under this section.
- For the purposes of sub-section (1) the expression "licensed person or organization" means a person or an organization which is in possession of a licence issued in terms of regulations made under the said sub-section, and the words "licence", "licensing" and "unlicensed" have corresponding meanings.
- Regulations made under sub-section (1) may prescribe penalties for any contravention thereof or failure to comply therewith, not exceeding a fine of £50.

Section 11 of the Bill amends the law relating to fees and allowances payable to members of the Medical and Dental Council or Pharmacy Board who are in the full-time salaried employment of the State.

Section 12. Section 96 of the principal Act is hereby amended by the addition at the end of the definition of "medical purpose"† in sub-section (1) of the following proviso:

"Provided that the Minister may grant authority, subject to compliance with such conditions or requirements as may be stated in such authority, for the administration outside a hospital or institution as aforesaid of a habit-forming drug for the satisfaction or relief of a habit or craving for the drug administered or for any other habit-forming drug, to the particular person referred to in such authority."

Section 13. This Act shall be called the Medical, Dental and Pharmacy Amendment Act, 1956.

† Section 83bis embodies the existing law relating to the control of blood transfusion and blood-transfusion organizations.

‡ The existing definition in section 96 is as follows: "Medicinal purpose" in relation to a habit-forming drug, means the treatment of a disease or some other definite curative or therapeutic purpose, but does not include the satisfaction or relief of a habit or craving for the drug used or for any other habit-forming drug except where the drug is administered or used in a hospital or similar institution maintained wholly or partly by the Government or a Provincial Administration, or approved for this purpose by the Minister."

CHARGES FOR DIVERSION OF TELEPHONE CALLS

The following letter dated 17 May 1956 from Pretoria has been addressed by the Under Secretary, Telecommunications, to Dr. J. H. Struthers, President of the Medical Association of South Africa.

With reference to your letter of 16 January, 1956, in regard to the charges applied for the diversion of telephone calls, I have to inform you that the matter has been reconsidered and that arrangements have been made for the existing charges to be replaced by the following:

Period of Diversion:	Charge per occasion s. d.
Up to 24 hours	1 0
Over 24 hours but not exceeding 48 hours	2 0
Over 48 hours but not exceeding 72 hours	3 0
Over 72 hours but not exceeding 96 hours	4 0
Over 96 hours but not exceeding 120 hours	5 0
Over 120 hours	10 0*

* Per month or part thereof.

A minimum charge of 3s. 0d. per occasion will be applied for the diversion of calls in automatic telephone exchange areas.

PASSING EVENTS : IN DIE VERBYGAAN

Guigoz Scholarships 1956. The Société des Produits Diététiques Guigoz, Vaudens, Switzerland, award annually an international scholarship intended to enable a student or medical graduate to devote one academic year to the study of the problems of infant and child feeding and nutrition. The scholarship, which for 1956 amounts to one million French francs, will be awarded by a Jury appointed by the International Children's Centre (ICC), Paris,

who will select the holders of the scholarships from persons who have submitted an application to the ICC, Chateau de Longchamp, Bois de Boulogne, Paris 16e, before 30 June 1956. Applicants are required (a) to send a curriculum vitae specifying their work concerning medical, biological and social problems on the feeding of infants and children, (b) to be presented by one of their teachers, and (c) to state the training they would like to be able to acquire

with the aid of the scholarship. The holder of the scholarship will be expected, at the end of his scholarship period, to send to the ICC a scientific or social paper on the subject which he will have studied. The Jury may divide the scholarship between two or more candidates, or may award only part of the scholarship.

The South African Paediatric Association has appointed Dr. Seymour Heyman of Johannesburg and Dr. Emilia Krause of Bloemfontein as their representatives at the Eighth International Congress of Paediatrics which will be held at Copenhagen in July. Dr. Heyman is also presenting a paper on the Treatment of Tuberculous Meningitis.

Dr. Eric Samuel, of Johannesburg, has left for an overseas visit to deliver a Hunterian professional lecture to the Royal College of Surgeons. Dr. Samuel will also lecture at the Karolinska Hospital, Stockholm, and will attend the Faculty of Radiologists meeting at Cambridge and the International Congress of Gastroenterology in London.

At the Quarterly Meeting of the Royal College of Physicians, Edinburgh, held on 1 May 1956, the President, Sir Stanley Davidson in the chair, the following were elected members of the college: M. F. Barry, M.B., Witwatersrand, D. T. Crichton, M.B., Witwatersrand, H. Weiskopf, B.Sc., M.B. Cape Town, R. P. Benson, M.B., Cape Town.

Union Department of Health Bulletin. Report for the 6 days ended 23 May 1956.

Plague, Smallpox, Typhus Fever. Nil.

Epidemic Diseases in Other Countries.

Plague. Nil.

Cholera in Calcutta (India).

Smallpox in Rangoon (Burma); Ahmedabad, Allahabad, Bombay, Calcutta, Cuddalore, Delhi, Kanpur, Karikal, Nagpur, Pondicherry, Tuticorin, Visakhapatnam (India); Gwadar (Muscat and Oman); Nhattrang (Viêt-Nam).

Typhus Fever in Alexandria (Egypt).

Cape Midland Branch. Address on Cerebral Palsy by Dr. Ben Epstein. Dr. Ben Epstein of Pretoria (Honorary Paediatrician to the Pretoria Cerebral Palsy School and Member of the Executive Committee, Cerebral Palsy Division, South African Cripple Care Society) delivered an address on 12 April at a meeting of the Cape Midland Branch of the Medical Association of South Africa. Dr. Epstein spoke on the subject of *Cerebral Palsy: Causes and Early Diagnosis*. His visit coincided with the opening of the new Cerebral Palsy school in Port Elizabeth, the fourth centre of this nature to be instituted in South Africa. In his address Dr. Epstein urged on practitioners the importance of early diagnosis in these cases; undue delay in referring patients to the Cerebral Palsy school might greatly hamper treatment. Two interesting films were also shown.

Dr. Ronald Singer, Senior Lecturer in Anatomy at the University of Cape Town, has been invited to become a Fellow of the American Anthropological Association. He has also been invited by the International Neanderthal Committee of the City of Dusseldorf to attend the Centenary meeting 26-29 August as their guest and to deliver an address. Recently Dr. Singer received a triple bursary from the Wenner-Gren Foundation for Anthropological Research, New York, the major part of which is to be utilized to travel to and deliver papers at the First International Congress on Human Genetics in Copenhagen (1-6 August), and the Fifth International Congress on Anthropological and Ethnological

Sciences in Philadelphia, USA (1-9 September). At the same time he will carry out studies at various research institutions in Europe, Scandinavia and the United States.

Dr. M. M. Suzman and Dr. B. Bronte-Stewart. Dr. M. M. Suzman of Johannesburg has left for Europe and America and will be away for approximately 2 months. He will address the British Cardiac Society at its Annual General Meeting on 24 May on the subject of *Long-term Anti-Coagulants in the treatment of Myocardial Infarction*. He will participate later in a panel discussion on *Arteriosclerotic Heart Disease* at the Joint Session of the Sections of Diseases of the Chest and of General Practice at the Annual Convention of the American Medical Association in Chicago on 15 June. Dr. B. Bronte-Stewart, of Cape Town, will talk in the same programme on *Nature Versus Nurture—Lessons from South Africa*.

The Annual Dinner of the Cape Western Branch will be held on Friday, 15 June 1956 at Arthur's Seat Hotel, Beach Road, Sea Point. Tickets are obtainable at the office of the Branch, Medical House, 35 Wale Street, Cape Town (P.O. Box 643) at a cost of 25s. each. All doctors visiting the Peninsula at that time are welcome.

Campbell Cup Golf Competition. This competition was played at Worcester on 19 May. The Worcester club gave the courtesy of the course and Medical Colleagues at Worcester entertained the visitors. The competition, played in favourable weather, was won by Dr. B. Joffe of Paarl with a score of plus one. He sank a long putt on the last green in the dark. The trophy for the winner was presented by Allen and Hanburys, and a bottle of whisky as a sweepstake was won by Dr. P. S. Willers of Beaufort West. All the money collected, amounting to £9 0s. 0d., has been donated to the Benevolent Fund.

An ordinary general meeting of the Queenstown Division was held in the Frontier Hospital, Queenstown, on 26 April 1956. Dr. M. I. Papilsky took the chair and there were 9 members present. The Chairman, Dr. Papilsky read a paper on Cretinism which is published in this issue of the *Journal* (page 547). Dr. F. E. Ingle thanked the chairman for the interesting paper and the excellent photographs and skiagrams of illustration. All members concurred, and it was agreed that it be sent to the *South African Medical Journal* for publication.

The following items were mentioned: (1) Increase in medical fees and Medical Aid Society fees, (2) Hospital Board nominations, and (3) Polio vaccination. Short discussions ensued.

It was agreed to request Dr. G. Dall to give a paper on orthopaedics at the next meeting.

The Health Officials' Association of Southern Africa will hold its 14th Annual Health Congress at Durban, Natal, on 22-26 October 1956. The Congress venue will be the 'Lido' Dome, South Beach. The Congress will be opened by the Hon. the Administrator of Natal, Mr. D. G. Shephstone. The provisional programme includes papers on Poliomyelitis, Health Education, Intestinal Parasites, Industrial Hygiene, Air Pollution and the Hygiene of a Large Seaport.

The Cape Town Sub-group of the South African Society for Industrial Health will hold its next meeting on Wednesday, 20 June at 8.15 p.m. at Medical Student's Common Room, Medical Residence, Mowbray, Cape. Dr. J. Marshall will address the meeting on skin conditions relating to industry, and Dr. J. G. Louw on eye conditions.

CORRESPONDENCE : BRIEWERUBRIEK

DISPENSING BY DOCTORS

To the Editor: I wish to endorse the sentiments so ably expressed by General Practitioner¹ in the *Journal* of 19 May.

We as a profession appear to have been much divided in recent years, with consequent loss of that solidarity which characterized our Association in the pre-war years.

The present threat by the Pharmaceutical Retailers Association should be resisted at all costs. The move to restrict the right of doctors represents 'Big Business', and the views expressed by the leaders of the Pharmaceutical Association can easily be refuted.

I know the proprietors of retail pharmacies in the towns in this area of the Union, and I have yet to find a single one who does not appear to be prosperous; many of them employ one,

two or three qualified assistants and a number of sales employees.

The humanitarian aspect has been entirely overlooked by the chemists, whose merchandising activities are chiefly with the more well-to-do 'paying' classes and whose knowledge of the poor and of their medical requirements is small. The dispensing doctor meets the needs of that vast sub-economic group of our multi-racial population which is voiceless in these matters. This section of the community cannot possibly afford to pay a medical fee, even a reduced one, and the chemist's charges as well. And the Provincial authorities could not cope with the flood of sub-economic patients who would, under the system suggested, be forced to attend the out-patient departments.

Another aspect is the peculiar position which would arise, if, in a small hamlet, a doctor who has established a dispensing practice were suddenly faced by a new pharmacy. Under the suggested restrictions, the established practitioner would have to make way for the pharmacist, sacrificing his all; or move to a distance of over 5 miles from the shop of the enterprising pharmacist.

We cannot sit back on this issue; the proposal is totally unjustified and, if successful, would spell ruin to a considerable proportion of our colleagues.

Opposition.

1. *General Practitioner* (1956): S. Afr. Med. J., 30, 483.

MALIGNANT DISEASE ON VACCINIA SCAR

To the Editor: I was very interested in a report of a case of squamous carcinoma on a vaccination scar,¹ which appeared in the *Journal* of 26 May.

In 1939,^{2,3} I reported a case of sarcomatosis following a primary vaccination against smallpox in a European girl at puberty. Since then I have seen 2 other cases of sarcoma manifesting themselves 2-4 weeks after vaccination against smallpox.

Dr. F. Duran-Reynals⁴ of Yale University, USA, who is working on the subject of vaccinia as a possible carcinogen states that he knows of cases of an epithelioma developing in the skin area following revaccination against smallpox.

J. Helman

4 Joubert Street
Vasco, C.P.
29 May 1956

1. E. Rea (1956): S. Afr. Med. J., 30, 499.
2. J. Helman (1939): *Ibid.*, 13, 334.
3. *Idem* (1954): *Ibid.*, 28, 488.
4. F. Duran-Reynals (1954): Personal communication.

DIE MEDIFSE FAKULTEIT VAN STELLENBOSCH

Aan die Redakteur: By geleentheid van die formele opening van die Universiteit van Stellenbosch op 29 Februarie 1956, het die Rektor (professor H. B. Thom¹) 'n rede gehou oor die stigting van die Geneeskundige Fakulteit. Daar is geen twyfel dat hy hom met louere van sy taak gekwyd het nie. Met die doel wat die Universiteit hom voor oë stel, die hoë ideale wat hy koester en die erns waarmee hy sy taak toegedaan is, kan mens seker wees dat sy werk en strewe met welslae bekroon sal word.

Vir een besondere rede het professor Thom se toespraak groot belangstelling by my gewek. Ek verwys na sy uitmuntende uiteensetting van die idee van Omvattende Geneeskunde. Met die uitsondering van die Mediese Skool te Durban, is dit die eerste keer dat een van ons Universiteite so rondborstig hom ten gunste van hierdie beginsel uitgespreek het.

Ek is natuurlik bewus van die feit dat die ander drie Universiteite ook besig is om aan hierdie gedagte te peusel. Maar hul werk is meer toegespits op die spesiale toestande waarin die familie van 'n bepaalde siektegeval verkeer. Algemene gesinsversorging in beperkte wyk-afdelings, gesondheidsopvoeding van die families en navorsingswerk maak nog sover nie juis deel uit van die opleiding wat hul mediese studente geniet nie.

Professor Thom meld dat hy hierdie nuwe beskouings in die buiteland, veral in Amerika, opgedoen het. Dit blyk dus dat hy nie bewus is van die feit dat die idees van Omvattende Geneeskunde en Gesinsversorging al lankal in ons eie land wortel geskiet het nie. Byna dertien jaar gelede is die Pholela-Gesondheid-

sentrum gestig om as loodssentrum te dien. Na gelang van die resultate daar behaal, is die werk met sukses bekroon. Later is die Instituut van Gesin en Samelewing te Clairwood in Durban geopen. Hierdie Instituut het hom toegewy aan navorsingswerk en die opleiding van personeel vir die reeks Gesondheidsentrums wat orals in ons land gestig is.

Hierdie werk het groot belangstelling in Amerika gewek en baie vooraanstaande medici het hierheen gekom om te verneem wat gaande is en wat daar te leer is. Later toe die werk van die Instituut gestaak is, het die Amerikaners hul bewondering getoon deur die Afdeling Gesinsversorging aan die Mediese Skool te Durban te help skep as gevolg van die gulhartigheid van die 'Rockefeller Foundation'.

Die Amerikaners bou nou op die fondament wat hier in Suid-Afrika gelê was. Dit sal dus jammer wees om nie gebruik te maak van die ondervinding wat daar in die Instituut al die jare opgedoen is nie.

Indien die nuwe Fakulteit volle uitvoering aan hierdie beskouings gee, sal by die opleiding van sy mediese studente bo verwagting verrek. Op die oomblik is ons algemene praktyse nie in staat om hul aangewese rol in die handhawing, opbou en bevordering van die algehele gesondheid in te neem nie. Ons bied dus die Universiteit van Stellenbosch ons heilwense met die daarstelling van sy nuwe Fakulteit en wens hom alle voorspoed in die toekoms toe.

J. Henson

'Three Pines'
Maclear-weg
Claremont, K.P.
25 Mei 1956

1. Thom H. B. (1956): S. Afr. T. Geneesk. 30, 300.

TOO MUCH 'PYGMALION' INTERFERENCE

To the Editor: 'The Provision of Medical and Dental Services in relation to Medical Ethics',¹ published in the *Journal* of 12 May, makes very interesting reading. Reference is made to a corporate body—Vanderbylpark Sick Benefit Fund—taking action 'in defiance of medical professional opinion as represented by the Medical Association of South Africa and . . . in contravention of South African law'.

If the submission is true, the remedy clearly lies in the hands of the Medical Association. They are bound to clear the air and prove once and for all that their views are well founded in that their resolutions will be binding on their members, on the one hand, and cannot lightly be ignored by members, or defied by any 'Frankenstein monster', 'cancerous growth', 'lay body', 'octopus', or merely 'benefit society', on the other hand.

Frankly I'm rather bored and bewildered by the various appellations at present used in official reports and debates. I am compelled to retort that some of our councillors talk and attempt to act as a 'trade union' without being registered as such. I must agree with some of our staunchest and most experienced members that the best service our pseudo-lawyers and pseudo-trade-unionists can possibly render to the Association is to retire from medical politics.

Please note that the 12 full-time general practitioners and 2 full-time specialists are happy as crickets with their conditions of service in the Vanderbylpark Sick Benefit Fund, and 17,000 souls are receiving a first-class medical service for which they can afford to pay. There is time enough for the Branch to interfere when its members lodge genuine complaints. It is not their duty to whip up a feeling of antagonism against well conducted and established sick funds.

They have barked too long and too often—they must now prove their point by biting Vanderbylpark Sick Fund in Court and proving their case; or by taking constitutional steps against all the members of the Association who have accepted posts which the Association has not approved. Otherwise the threats of expulsion, so often repeated, are just so much 'hokey'.

One of those 'Full-Timers'

28 May 1956

1. Memorandum (1956): S. Afr. Med. J., 30, 458.